Vol. 899 Number 4

# OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

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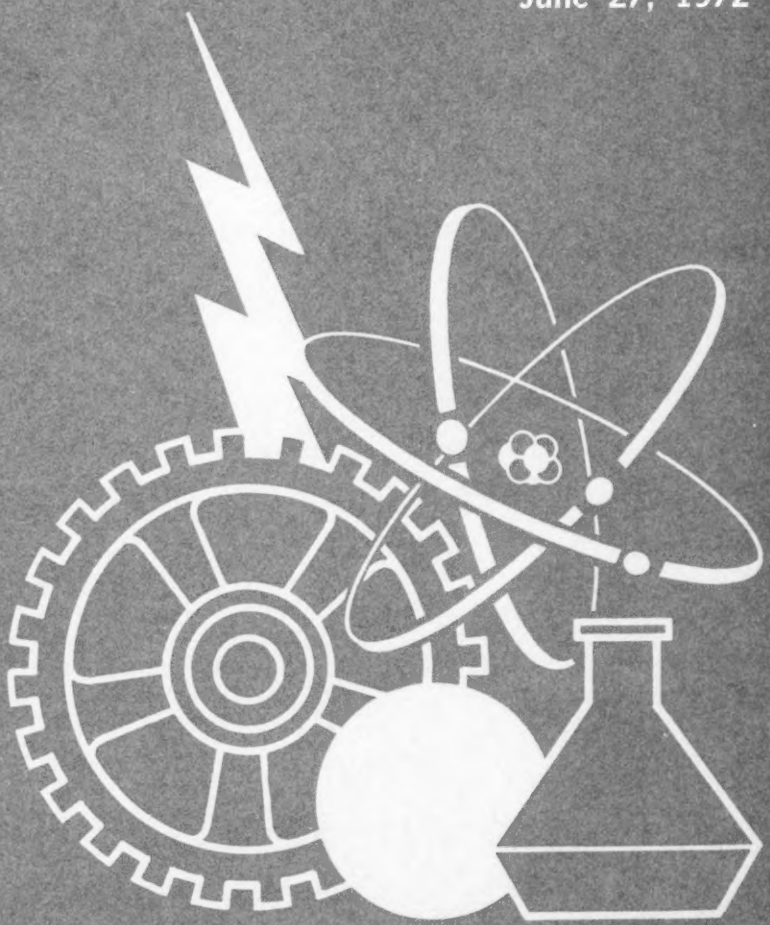
A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

June 27, 1972



U. S. DEPARTMENT OF COMMERCE

Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

June 27, 1972 Volume 899 Number 4

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# PATENT OFFICE NOTICES

## Graphic Symbols for Patent Drawings

Rule 84(g) of the Rules of Practice in Patent Cases indicates that graphic drawing symbols and other labeled representations may be used for conventional elements where appropriate, subject to approval by the Office. Also, suitable legends may be used, or may be required, in proper cases.

The Rules of Practice pamphlet has, since the turn of the century, included a section entitled "Symbols for Draftsman" showing various symbols which may be used on patent application drawings. Although these symbols still reflect current practice they are somewhat limited in number and scope. A more complete set of symbols might be beneficial to both the Office and the public since it would foster uniformity of presentation, and more informative drawings. However, for the Office to develop and maintain a substantially complete listing of all graphic drawing symbols would be both difficult and time-consuming.

Therefore, since the American National Standards Institute Inc., 1430 Broadway, New York, N.Y., 10018, publishes a series of publications relating to graphic symbols under its Y32 and Z32 headings, the Office is calling the attention of patent applicants to these symbols for their consideration and use where appropriate in patent drawings. The below listed publications have been reviewed by the Office and the symbols therein are considered to be generally acceptable in patent drawings. Although the Office will not "approve" all of the listed symbols as a group because their use and clarity must be decided on a case-by-case basis, these publications may be used as guides when selecting graphic symbols. Overly specific symbols should be avoided. Symbols with unclear meanings should be labeled for clarification. As noted in Rule 84(g), the Office will retain final authority to approve the use of any particular symbol in any particular case.

The reviewed publications are the following:

| | |
|---|---|
| Y32.2–1970. Graphic Symbols for Electrical and Electronics Diagram | $11.50 |
| Y32.10–1967. Graphic Symbols for Fluid Power Diagrams | 3.00 |
| Y32.11–1961. Graphic Symbols for Process Flow Diagrams in the Petroleum and Chemical Industries | 2.00 |
| Y32.14–1962. Graphic Symbols for Logic Diagrams | 4.75 |
| Z32.2.3–1949 (R1953). Graphic Symbols for Pipe Fittings, Valves and Piping | 2.00 |
| Z32.2.4–1949 (R1953). Graphic Symbols for Heating, Ventilating and Air Conditioning | 2.00 |
| Z32.2.6–1950. Graphic Symbols for Heat-Power Apparatus | 2.00 |

No change in the Rules of Practice is considered necessary at this time.

The above list of publications will be included in the Manual of Patent Examining Procedure.

RICHARD A. WAHL,
*Assistant Commissioner.*

May 19, 1972.

## Changes in Charges for Copies

The Patent Office is announcing a change in the charges for copies of materials produced on coin-operated copiers located at Crystal Plaza. The charge will be 15¢ per page.

This change will be effective within the next 30 to 45 days due to the engineering changes necessary to accommodate the difference in number and value of coins.

The Patent Office will monitor this change for a period of six months to: (1) Evaluate effects on other services, equipment utilization, materials, and facilities; and, (2) Ensure that the new charge of 15¢ per page will enable the Patent Office to fully recover the cost of operating the copiers.

At the end of the period, the data obtained will be evaluated with a view to continuance or discontinuance of the reduced rate.

ROBERT GOTTSCHALK,
*Commissioner of Patents.*

June 6, 1972.

## Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

**2,604,313, F. W. Grantham, DRYERS; 2,643,463, same, LAUNDRY APPARATUS, filed Feb. 12, 1968, D.C., N.D. Ill. (Chicago), Doc. 68c251, *Paulette Grantham et al.* v. *McGraw-Edison.*** Final order of dismissal by stipulation, complaint as amended and all counterclaims are dismissed with prejudice, Jan. 17, 1972.

**2,643,463.** (See 2,604,313.)

**2,795,987, G. F. Schlote, SPIRAL-DRIVE, SLIDABLE SIDE JAW WRENCH, filed Jan. 24, 1972, D.C. Colo. (Denver), Doc. C–3675, *Space Tool, Inc. et al.* v. *Kenneth F. Halls.***

**2,839,196, W. C. Schwalge, OIL RECLAIMER, filed Feb. 14, 1972, D.C., W.D. Okla. (Oklahoma City), Doc. 72–95–C, *Prelin Industries, Inc.* v. *G & G. Crafts, Inc. and George E. Barrow.***

**2,846,278, W. J. Blazek, POSITIONING MEANS FOR GUIDE ASSEMBLIES OF PUNCH PRESS DIE SETS, filed July 22, 1969, D.C., E.D. Wis. (Milwaukee), Doc. 69–C–360, *Lempco Industries, Inc.* v. *Superior Die Set Corp.*** Stipulated order, plaintiff owner of patent. Plaintiff's complaint and defendant's counterclaim are hereby dismissed with prejudice, Feb. 14, 1972.

**2,934,932, H. B. Wagner, HYDRAULIC CEMENT MORTAR COMPOSITIONS AND METHODS OF USE; 2,990,382, Wagner and Fitzgerald, COMPOSITION COMPRISING HYDRAULIC CEMENT, METHYL CELLULOSE AND REEMULSIFIABLE POLYVINYL ACETATE, METHOD OF PREPARING SAME AND MORTAR PREPARED THEREFROM, filed Nov. 4, 1971, D.C., N.D. Calif. (San Francisco), Doc. 71–2125, *Title Council of America, Inc.* v. *Garland White & Co., Inc.***

**2,990,382.** (See 2,934,932.)

**2,998,927, E. P. Aghnides, FLUID MIXING DEVICES; 3,130,918, same, SLOTLESS AERATOR, filed Aug. 11, 1969, D.C. Md. (Baltimore), Doc. 21076, *Elie P. Aghnides* v. *F. W. Woolworth Company.*** Final judgment, Patent 2,998,927 is invalid and complaint is dismissed with prejudice; complaint is dismissed without prejudice as to Patent 3,130,918 subject to terms and conditions of stipulation of counsel, Jan. 27, 1972.

**3,048,848, R. W. May, METHOD AND APPARATUS FOR CHART RECORDING, filed Mar. 2, 1972, D.C.N.J. (Newark), Doc. 406–72, *Gulton Industries, Inc.* v. *Esterline Corporation.***

**3,072,582, C. B. Frost, POLYETHER-URETHANE FOAMS AND METHOD OF MAKING SAME, filed Mar. 26, 1970, D.C. Del. (Wilmington), Doc. 3867, *The General Tire & Rubber Company* v. *Reichhold Chemicals, Inc.*** Order of dismissal upon consent, parties entered into an agreement in settlement; complaint dismissed with prejudice. Counterclaim dismissed with prejudice, Feb. 22, 1972.

**3,101,535, M. G. Andis, BLADE ASSEMBLY WITH LATERAL EXTENSIONS, filed Feb. 22, 1972, D.C., E.D. Wis. (Milwaukee), Doc. 72–C–107, *Andis Clipper Co.* v. *Oster Corporation.***

**3,116,557, J. R. Trice, Jr., METHOD AND MEANS FOR LAYING SEWER PIPE, filed Sept. 30, 1968, D.C., N.D. Ind. (South Bend), Doc. 4261, *Alignment Systems, Inc.* v. *Woodruff and Sons, Inc. and Roy J. Woodruff.*** Judgment entered in plaintiff's favor and against defendant with respect to validity of subject patent; judgment in defendant's favor and against plaintiff with respect to plaintiff's claims of infringement of subject patent, Dec. 30, 1971.

**3,122,483, M. W. Rosenthal, STRONTIUM ION TOOTHPASTE, filed Feb. 8, 1972, D.C., S.D.N.Y., Doc. 72–C–585, *Block Drug Company, Inc.* v. *Thrifty Cosmetics and Sundries, Inc.***

**3,130,918.** (See 2,998,927.)

**3,135,019, E. O. Aichele, MACHINE FOR APPLYING SEALING LINERS OF THERMOPLASTIC MATERIAL TO BOTTLE CAPS OR THE LIKE, filed Jan. 24, 1972, D.C., S.D. Ind. (Indianapolis), Doc. IP 72–C–30, *Zapata Industries, Inc.* v. *H-C Industries, Inc.***

**3,275,816,** G. V. Cleary, INSERT FOR NEWSPAPERS, **filed** Jan. 7, 1971, D.C., N.D. Ill. (Chicago), Doc. 72c58, *Free Standing Stuffer, Inc.* v. *Time Inc.*

**3,278,949,** B. T. Whitaker, SWIMMING POOL CLEANING APPARATUS, **filed** Feb. 9, 1972, D.C., M.D. Fla. (Orlando), Doc. 72–31–Orl–C, *Poolmaid, Inc.* v. *Tropicana Pools, Inc. and Ben W. Walters.*

**3,287,693,** S. M. Bagno, TRANSDUCER-TRANSFORMER UNIT, **filed** Jan. 25, 1972, D.C.N.J. (Newark), Doc. C–155–72, *Systron-Donner Corporation* v. *Emergency Products Corporation.*

**3,292,615,** Bascomb and Mayer, DEVICE FOR AGITATING, SWIRLING AND AERATING THE WATER IN A VESSEL, SUCH AS A BATH TUB OR THE LIKE, **filed** July 7, 1967, D.C., N.D. Ill. (Chicago), Doc. 67c1170, *Boulevard Electronics Inc.* v. *Marshall Field & Co., J. C. Penney Co., Co-Op Electric Supply Co.* Judgment for defendants, plaintiff failed to establish an invention justifying patent in suit and that there can be no infringement, Jan. 30, 1971.

**3,293,094,** Nairn, Harkins, Ehrenfeld and Tarlow, TEXTURED FOAM PROCESSES; **3,293,108,** same **filed** Dec. 20, 1966, D.C., E.D. Pa. (Philadelphia), Doc. 41762, *Congoleum Industries, Inc.* v. *Armstrong Cork Company.* Order, judgment in favor of the plaintiff, and against the defendant, holding that Patents 3,293,094 and 3,293,108 are valid and infringed. Defendant's commercial process infringes claims 1, 2, 3, 5, 6, 7, 8, 9, 16, 21, 22, 26, 27, 28, 29, 30, 32, 55, 62, of Patent 3,293,094, and claims 1, 2, 3, 4, 5, 6, 11, 15, 16, 17, 18, 20, 21, 25, 26, 28, 30, 33, 34 and 39 of Patent 3,293,108. Defendant's infringement has not been willful and wanton, Feb. 23, 1972.

**3,293,108.** (See 3,293,094.)

**3,305,278,** J. Kilbourne, MINING APPARATUS SUPPORTING AND DRIVING CONSTRUCTION, **filed** Jan. 26, 1972, D.C., W.D. Pa. (Pittsburgh), Doc. 72–77, *National Mine Service Company* v. *Jeffrey Galion, Inc.*

**3,312,124,** Meier and Meier, STEERING-WHEEL ASSEMBLY FOR AUTOMOTIVE VEHICLES, **filed** Feb. 18, 1972, D.C., N.D. Ohio (Cleveland), Doc. 72–177, *Kamei-Autokomfort and Superibr Industries* v. *Giant Tiger Stores, Inc.* **Same, filed** Feb. 16, 1972, D.C., N.D. Calif. (San Francisco), Doc. C–72–289–AJZ, *Kamei-Autokomfort Corp.* v. *Gus Mozart, doing business as Eurasia Automotive Products.*

**3,349,426,** R. S. Haydock, HOODED CASTER WHEEL ASSEMBLY, **filed** Jan. 31, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–218–R, *Mildred R. Haydock et al.* v. *Shin Kuno, Torii Co. et al.*

**3,353,770,** W. Sondheim, UNIVERSAL PUMP BOX APPARATUS, **filed** Dec. 1, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–2844–MML, *Permco Corporation* v. *Coxwell's Inc., Specialty Equipment Fabricating Co.* **Same, filed** Feb. 11, 1972, D.C., N.D. Ga. (Atlanta), Doc. 16193, *Permco Corporation* v. *A.G.N. Manufacturing, Inc. and National Steel Form Corp.*

**3,363,422,** L. A. Turzillo, METHOD AND APPARATUS FOR ANCHORING A TIE-DOWN BAR IN AN EARTH SITUS, **filed** Sept. 9, 1968, D.C., N.D. Ohio (Cleveland), Doc. C–68–671, *Lee Turzillo Contracting Co., Inc.* v. *Intrusion Prepakt, Inc., Prepakt Concrete Company.* Consent judgment, plaintiff owner of patent, parties have settled in full plaintiff's claim for damages, Jan. 28, 1972.

## Dedications

2,978,705.—*Sigurd M. Moberg*, Pompton Plains, N.J. MACHINE FOR APPLYING TAGS. Patent dated Apr. 11, 1961. Dedication filed Feb. 9, 1972, by the assignee, *E. J. Brooks Company*.

Hereby dedicates to the Public the term thereof remaining after Oct. 1, 1970.

2,978,706.—*Sigurd M. Moberg*, Pompton Plains, N.J. TAG APPLYING APPARATUS. Patent dated Apr. 11, 1961. Dedication filed Feb. 9, 1972, by the assignee, *E. J. Brooks Company*.

Hereby dedicates to the Public the term thereof remaining after Oct. 1, 1970.

2,990,322.—*Howard A. Jones*, and *John A. Garman*, Baltimore, Md., and *Berton C. Dickinson*, Lyndonville, N.Y. SYNERGISTIC INSECTICIDAL COMPOSITIONS. Patent dated June 27, 1961. Dedication filed Nov. 4, 1971, by the assignee, *FMC Corporation*.

Hereby dedicates to the Public the remaining term of said patent.

2,992,986.—*William T. Ingram*, Whitestone, N.Y. TREATMENT OF SEWAGE AND OTHER WASTE MATERIAL. Patent dated July 18, 1961. Dedication filed Mar. 14, 1972, by the assignee, *Monsanto Enviro-Chem Systems, Inc.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,325,989.—*Edgar Dare Bolinger*, Spartanburg, S.C. BALANCED ELASTICIZED MULTIFILAMENT YARN. Patent dated June 20, 1967. Dedication filed June 22, 1971, by the assignee, *Deering Milliken Research Corporation*.

Hereby dedicates to the Public the entire remaining term thereof falling on and after Feb. 20, 1979.

3,475,651.—*George D. Harding* and *Howard L. Storm*, Syracuse, N.Y. CHARGING AND TRIGGERING CIRCUITS FOR PULSED ELECTRICAL DEVICES SUCH AS FLASH LAMPS. Patent dated Oct. 28, 1969. Dedication filed Jan. 12, 1972, by the assignee, *General Electric Company*.

Hereby dedicates to the Public the above-identified patent.

## Certificates of Correction for the Week of June 27, 1972

| | | | |
|---|---|---|---|
| D. 220,678 | 3,575,430 | 3,599,460 | 3,614,759 |
| D. 220,736 | 3,579,545 | 3,600,324 | 3,614,875 |
| 3,163,654 | 3,579,807 | 3,600,694 | 3,615,267 |
| 3,347,940 | 3,580,455 | 3,601,164 | 3,615,323 |
| 3,408,918 | 3,580,962 | 3,601,380 | 3,615,382 |
| 3,442,594 | 3,582,333 | 3,602,183 | 3,615,428 |
| 3,450,555 | 3,584,542 | 3,602,303 | 3,615,829 |
| 3,458,957 | 3,587,146 | 3,604,493 | 3,616,030 |
| 3,462,329 | 3,588,228 | 3,606,271 | 3,616,295 |
| 3,497,584 | 3,588,827 | 3,607,013 | 3,616,651 |
| 3,510,386 | 3,590,692 | 3,607,269 | 3,616,848 |
| 3,522,560 | 4,591,091 | 3,608,638 | 3,616,964 |
| 3,525,872 | 3,591,582 | 3,608,777 | 3,617,108 |
| 3,535,347 | 3,592,401 | 3,609,005 | 3,617,211 |
| 3,538,120 | 3,592,733 | 3,609,138 | 3,617,252 |
| 3,542,087 | 3,592,807 | 3,609,219 | 3,617,291 |
| 3,548,424 | 3,593,808 | 3,610,018 | 3,617,306 |
| 3,549,897 | 3,594,120 | 3,610,097 | 3,617,341 |
| 3,555,043 | 3,594,716 | 3,611,005 | 3,617,362 |
| 3,558,852 | 3,595,327 | 3,611,897 | 3,617,553 |
| 3,559,585 | 3,595,886 | 3,611,984 | 3,617,720 |
| 3,562,197 | 3,596,065 | 3,612,829 | 3,617,889 |
| 3,562,331 | 3,597,229 | 3,612,900 | 3,618,000 |
| 3,564,372 | 3,597,453 | 3,613,086 | 3,618,062 |
| 3,565,804 | 3,597,554 | 3,613,513 | 3,618,089 |
| 3,572,657 | 3,597,589 | 3,613,796 | 3,618,565 |
| 3,572,814 | 3,598,155 | 3,613,898 | 3,619,465 |
| 3,574,223 | 3,598,661 | 3,614,659 | 3,619,709 |
| 3,574,786 | 3,598,858 | 3,614,662 | 3,619,811 |
| 3,619,983 | 3,625,941 | 3,634,528 | 3,641,628 |
| 3,619,997 | 3,625,971 | 3,634,587 | 3,641,834 |
| 3,620,745 | 3,626,665 | 3,634,673 | 3,642,062 |
| 3,620,785 | 3,626,944 | 3,634,762 | 3,642,127 |
| 3,620,786 | 3,627,514 | 3,634,827 | 3,642,331 |
| 3,620,900 | 3,627,606 | 3,635,108 | 3,642,464 |
| 3,620,915 | 3,627,637 | 3,635,201 | 3,642,585 |
| 3,620,930 | 3,627,742 | 3,635,283 | 3,642,787 |
| 3,620,938 | 3,627,820 | 3,635,337 | 3,642,809 |
| 3,620,990 | 3,627,895 | 3,635,345 | 3,643,192 |
| 3,621,066 | 3,628,664 | 3,635,408 | 3,643,666 |
| 3,621,068 | 3,629,058 | 3,635,616 | 3,643,822 |
| 3,621,071 | 3,629,226 | 3,635,791 | 3,643,968 |
| 3,621,143 | 3,629,242 | 3,635,933 | 3,644,107 |
| 3,621,175 | 3,629,676 | 3,636,072 | 3,644,239 |
| 3,621,203 | 3,629,923 | 3,636,176 | 3,644,348 |
| 3,621,209 | 3,630,237 | 3,636,427 | 3,644,497 |
| 3,621,340 | 3,630,438 | 3,636,554 | 3,644,521 |
| 3,621,409 | 3,630,590 | 3,637,544 | 3,645,005 |
| 3,621,462 | 3,630,691 | 3,637,596 | 3,645,213 |
| 3,621,658 | 3,630,759 | 3,637,671 | 3,645,246 |
| 3,621,847 | 3,630,790 | 3,637,797 | 3,645,267 |
| 3,622,220 | 3,630,958 | 3,638,274 | 3,645,299 |
| 3,622,398 | 3,631,032 | 3,638,309 | 3,645,635 |
| 3,622,436 | 3,631,054 | 3,638,659 | 3,645,666 |
| 3,622,501 | 3,631,142 | 3,638,678 | 3,645,673 |
| 3,622,750 | 3,631,180 | 3,638,902 | 3,645,715 |
| 3,622,772 | 3,631,260 | 3,638,937 | 3,645,718 |
| 3,622,802 | 3,631,315 | 3,639,104 | 3,645,859 |
| 3,622,808 | 3,632,018 | 3,639,160 | 3,645,897 |
| 3,623,452 | 3,632,176 | 3,639,266 | 3,646,301 |
| 3,623,485 | 3,632,345 | 3,639,281 | 3,646,456 |
| 3,623,502 | 3,632,395 | 3,639,375 | 3,646,508 |
| 3,623,945 | 3,632,526 | 3,639,387 | 3,646,814 |
| 3,624,104 | 3,632,574 | 3,639,530 | 3,647,063 |
| 3,624,156 | 3,632,587 | 3,639,536 | 3,647,369 |
| 3,624,178 | 3,632,779 | 3,640,365 | 3,647,443 |
| 3,624,180 | 3,632,828 | 3,640,494 | 3,647,762 |
| 3,624,482 | 3,632,850 | 3,640,557 | 3,647,820 |
| 3,624,673 | 3,633,234 | 3,640,584 | 3,647,904 |
| 3,624,676 | 3,633,695 | 3,640,661 | 3,649,428 |
| 3,624,961 | 3,634,130 | 3,640,680 | 3,649,699 |
| 3,625,288 | 3,634,238 | 3,640,784 | 3,650,885 |
| 3,625,702 | 3,634,266 | 3,641,102 | 3,650,428 |
| 3,625,730 | 3,634,329 | 3,641,138 | 3,651,075 |
| 3,625,829 | 3,634,387 | 3,641,363 | 3,653,838 |
| 3,625,879 | 3,634,460 | 3,641,527 | 3,655,561 |
| 3,625,938 | 3,634,515 | 3,641,552 | |

## Patents Available for Licensing or Sale

2,995,619. SYSTEM OF TELEVISION TRANSMISSION AND PHOTOGRAPHIC REPRODUCTION OF THE TELEVISED IMAGE. Samuel Freeman, 13 Birchwood Court East, Syosset, N.Y., 11791.

3,299,868. AUTOMATIC IDLER. Lowell Dean Henke, Box 616, Hobson, Mont., 59452.

3,508,406. COMPOSITE ARCH STRUCTURE. Armco Steel Corporation, Middletown, Ohio. Correspondence to: Melville, Strasser, Foster & Hoffman, 1215 Provident Tower, 1 E. 4th St., Cincinnati, Ohio, 45202.

3,525,099. HAND GUIDED WALK-BEHIND SELF-PROPELLED MATERIAL CONVEYING CART. John Fuhrmann. Correspondence to: Robert C. Weber, 1022 Ellicott Square, Buffalo, N.Y., 14203.

3,625,664. PROCESS FOR THE PRODUCTION OF RICH FUEL TO REPLACE NATURAL GAS BY MEANS OF CATALYTIC HYDROGASIFICATION UNDER PRESSURE OF FLUID HYDROCARBONS. Carlo Padovani. Correspondence to: Murphy & Dobyns, 2001 Jefferson Davis Highway, Suite 307, Arlington, Va., 22202.

3,634,970. WRAPPING FOR TREE ROOT BALLS. Nicholas Williams, 508 Central Ave., Scarsdale, N.Y., 10583.

3,652,508. VISCOSITY STABLE ALIPHATIC POLYURETHANE COMPOSITIONS AND METHOD OF PREPARATION THEREOF. Donald L. Segur et al. Correspondence to: Henry B. Townsend, General Latex and Chemical Corporation, Research Center, High St., North Billerica, Mass., 01862.

3,652,787. TELEVISION SIGNAL COLOR CORRECTOR. Katarina Tkacenko, 620 Iris Ave., Apt. #319, Sunnyvale, Calif., 94086.

The following 2 patents are offered by: Clarence Willard Franklin, Cedar Tree Farm, Milford, Calif., 96121.

3,540,089. SELF-RELEASING ANIMAL TETHER.

3,640,013. SUBCALIBER ADAPTER FOR FIREARM.

The following 2 patents are offered by: W. Greenhalgh, P.O. 521. Oshawa, Ontario, Canada, and D. K. Soper, 1221 Simcoe St. N., Apt. 623 East, Oshawa, Ontario, Canada.

3,484,011. DISPOSABLE CONTAINER LINER AND ADVERTISING MEANS.

3,610,455. DISPOSABLE CONTAINER LINER WITH REMOVAL MEANS.

---

The following 6 patents are offered by: W. Greenhalgh, P.O. 521, Oshawa, Ontario, Canada.

3,527,008. INSTANTERECT CONSTRUCTION DEVICE.

3,600,870. INSTANTERECT CONSTRUCTION DEVICE.

3,611,659. PREFABRICATED ROOF STRUCTURE.

3,614,050. REUSABLE FORMING UNIT.

3,624,889. MOBILE PLANT FOR THE FABRICATION OF STRUCTURAL MODULES.

3,656,724. PAKAHOME.

---

Cerebro-Dynamics, Inc., offers to sell or license the following 2 patents on reasonable terms.

Inquiries should be directed to: Richard L. Bohanon, Cerebro-Dynamics, Inc., 1405 City National Bank Tower, Oklahoma City, Okla., 73102.

3,592,006. ISOLATION DEVICE.

3,653,215. METHOD AND APPARATUS FOR CONFINING AND COLLECTING OIL LEAKAGE.

---

Fibersteel International Company is prepared to grant semi-exclusive licenses under the following patent at reasonable royalties to marine construction firms and ferro-cement boat builders.

Inquiries respecting licenses should be addressed to Fibersteel International Company, Attn: M. E. Iorns, P.O. Box 661, West Sacramento, Calif., 95691.

3,652,755. METHOD OF FORMING REINFORCED CONCRETE STRUCTURE.

---

General Motors Corporation is prepared to grant non-exclusive license under the following patent upon reasonable terms.

Applications for license may be addressed to: The Director, Patent Section, General Motors Building, 3044 W. Grand Blvd., Detroit, Mich., 48202.

3,486,833. HIGH TEMPERATURE COMPOSITE GAS TURBINE ENGINE COMPONENTS.

---

General Electric Company is prepared to grant non-exclusive licenses under the following 38 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following patent should be addressed to: Division Patent Counsel, Switchgear Equipment Business Division, General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa., 19142.

3,579,079. CURRENT SOURCE MAGNETIC GATING CIRCUIT FOR CONTROLLED RECTIFIERS.

Applications for license under the following 5 patents should be addressed to: Division Patent Counsel, Space Division, General Electric Company, P.O. Box 8555, Philadelphia, Pa.

3,598,997. SCHOTTKY BARRIER ATOMIC PARTICLE AND X-RAY DETECTOR.

3,639,845. COMPENSATING THRESHOLD LEVEL DETECTOR.

3,641,531. CHANGEABLE ADDRESS DISPLAY DEVICE.

3,648,037. SYMMETRICAL FUNCTION GENERATOR.

3,648,314. SELF-STABILIZING FLOTATION MODULE.

Applications for license under the following 6 patents may be addressed to: General Electric Company, Appliance Components Business Division, 1635 Broadway, Fort Wayne, Ind., 46804. Attn: Patent Counsel.

3,582,556. TEMPERATURE SENSING RELAY.

3,607,553. APPARATUS FOR PRODUCING A PROTECTIVE COATING ON THE SURFACE OF A MANUFACTURED ARTICLE.

3,616,056. APPARATUS FOR COMPRESSING A LAMINATED ARTICLE AND FOR FORMING A PROTECTIVE COATING OF INSULATING MATERIAL ON AN ARTICLE.

3,620,885. APPARATUS FOR APPLYING UNHARDENED ADHESIVE MATERIAL TO A LAMINATED STRUCTURE.

3,620,886. METHOD FOR BONDING A LAMINATED STRUCTURE AND APPARATUS FOR APPLYING UNHARDENED ADHESIVE MATERIAL TO THE LAMINATED STRUCTURE.

3,638,470. METHOD OF MAKING A FAN.

Applications for license under the following 9 patents may be addressed to: General Electric Company, Electronic Systems Division, 100 Plastic Ave., Pittsfield, Mass., 01201.

3,449,977. GEAR MESHING ARRANGEMENT.

3,316,745. METHOD OF DIELESSLY FORMING SURFACE OF REVOLUTION.

3,354,725. ACCELEROMETER.

3,479,886. ACCELEROMETER.

3,380,788. HYDROSTATIC BEARING.

3,387,482. BEARING SUSPENSION SYSTEM.

3,471,759. PULSE WIDTH MODULATION SERVO SYSTEM INCLUDING A UNIQUE TRANSFORMERLESS DEMODULATOR.

3,623,188. LINEAR DC VOLTAGE TO FIRING ANGLE CONVERTER CIRCUIT.

3,303,810. DRAG REDUCTION WITH RECIRCULATION.

Applications for license under the following 18 patents may be addressed to: Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky., 40225.

3,087,319. CLOTHES WASHING MACHINE WITH WATER LEVEL CONTROL CIRCUIT.

3,367,609. HERMETIC COMPRESSOR UNIT AND SPRING SUPPORT MEANS THEREOF.

3,506,325. REFRIGERATOR INCLUDING ILLUMINATED CABINET SHELF.

3,526,738. PHASE-MATCHING DEVICE FOR ELECTRONIC OVENS.

3,593,743. FAUCET-COUPLING ASSEMBLY FOR A WASHING MACHINE.

3,612,074. CLEANING AGENT DISPENSING DEVICE IN A DISHWASHER.

3,621,856. ROTARY CONTROL MEANS FOR CHANGING THE FORCE OF WASHING ACTION IN AN AUTOMATIC DISHWASHER.

3,630,227. ASSEMBLY FOR COUPLING A WASHING MACHINE TO A FAUCET.

3,632,982. COMBINATION ELECTRIC GRIDDLE AND COOKTOP.

3,633,622. VALVE MECHANISM FOR DISHWASHER.

3,635,243. FAUCET-COUPLING ASSEMBLY FOR A WASHING MACHINE.

3,642,208. WASHER WITH SELF-REVERSING SPRAY ARM ASSEMBLY.

3,643,464. EXTERNAL ICE SERVICE.

3,643,930. APPARATUS FOR ADDING MOISTURE TO AIR.

3,647,354. FABRIC-TREATING METHOD.

3,650,673. DRY WASH FABRIC CLEANING METHOD AND APPARATUS.

3,654,772. ICE MAKER.

3,656,182. HYDRAULIC THERMOSTAT WITH DOUBLE THROW SWITCH MECHANISM.

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## Patents Withdrawn From Register

General Electric Company hereby withdraws the following 2 patents from the Register of Patents Available for Licensing or Sale. The patents were listed as being available in the OFFICIAL GAZETTE as indicated below:

3,101,889. RESILIENT MOUNTING FOR MOTOR AND FAN UNIT. Aug. 4, 1964.

3,259,268. COVER AND LATCH ARRANGEMENT FOR PORTABLE VACUUM CLEANERS. Nov. 24, 1970.

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## Disclaimers

2,810,676.—*Bartholdt C. Hadler,* and *Earl L. Pelton,* Midland, Mich. ANTHELMINTIC SOLUTIONS COMPRISING PIPERAZINE COMPOUNDS. Patent dated Oct. 22, 1957. Disclaimer filed Mar. 2, 1972, by the assignee, *The Dow Chemical Company.*

Hereby enters this disclaimer to claims 1 and 3 of said patent.

2,957,106.—*Hannah C. Moodey*, Lancaster, Pa. PLURAL BEAM GUN. Patent dated Oct. 18, 1960. Disclaimer filed Jan. 14, 1972, by the assignee, *RCA Corporation*.

Hereby enters this disclaimer to claims 6 and 12 of said patent.

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3,387,322.—*Josef Woellhaf* and *Herbert Wagner*, Ludwigshafen (Rhine), *Wilhelm Uhl*, Frankenthal, Pfalz, and *Otto Hedderich*, Schifferstadt, Pfalz, Germany. APPARATUS FOR THE PRODUCTION OF HOMOGENEOUS SHEETING. Patent dated June 11, 1968. Disclaimer filed Dec. 8, 1971, by the assignee, *Badische Anilin- & Soda-Fabrik Aktiengesellschaft*.

Hereby enters this disclaimer to claim 3 of said patent.

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3,452,790.—*Francis E. Vandervyde*, Gilroy, *Thomas E. Roberts, Jr.*, Saratoga, and *Arthur L. McGee*, San Jose, Calif. SHEET PATCHING MACHINE. Patent dated July 1, 1969. Disclaimer filed Feb. 14, 1972, by the assignee, *FMC Corporation*.

Hereby disclaimed the portion of the term of the patent subsequent to May 27, 1986.

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3,498,689.—*Roger L. Hansen*, Minnetonka Village, Minn. LAUNDRY CART. Patent dated Mar. 3, 1970. Disclaimer filed Mar. 15, 1972, by the inventor.

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

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3,559,836.—*Harold E. Pink* and *Ronald G. Daringer*, Cambridge, Md. WIRE CLOTH TRAY. Patent dated Feb. 2, 1971. Disclaimer filed Feb. 10, 1972, by the assignee, *Cambridge Wire Cloth Company*.

Hereby enters this disclaimer to claims 22 and 23 of said patent.

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3,566,281.—*Donald Dennis Baumann*, Los Gatos, Calif. ELECTRIC PULSE WAVE CLIPPING CIRCUITRY. Patent dated Feb. 23, 1971. Disclaimer filed Jan. 20, 1972, by the assignee, *International Business Machines Corporation*.

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5, 7 and 11 of said patent.

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3,593,782.—*John G. Draves*, Dunkirk, *Maurice R. Garrison*, Hamburg, and *Edward J. Skiba*, Williamsville, N.Y. HEAT EXCHANGER. Patent dated July 20, 1971. Disclaimer filed Apr. 12, 1972, by the assignee, *Robert C. Hagner*.

Hereby enters this disclaimer to claims 1, 8 and 9 of said patent.

# PATENT EXAMINING CORPS

**R. A. WAHL, Assistant Commissioner**
**F. H. BRONAUGH, Deputy Assistant Commissioner**

## CONDITION OF PATENT APPLICATIONS AS OF MAY 30, 1972

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices. | 3-26-71 |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides. | 1-04-71 |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes. | 3-03-71 |
| COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography. | 3-01-71 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. | 12-16-70 |
| **ELECTRICAL EXAMINING GROUPS** | |
| INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous. | 10-07-71 |
| SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material. | 2-22-71 |
| INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts. | 5-12-71 |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring. | 4-19-71 |
| PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments. | 4-09-71 |
| DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts. | 1-25-71 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages. | 5-03-71 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks. | 3-01-71 |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination. | 2-18-71 |
| HEAT, POWER AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing. | 6-01-71 |
| CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling. | 3-22-71 |

**Expiration of patents:** The patents within the range of numbers indicated below expire during June 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,709,808 to 2,712,130, inclusive
Plant Patents..... Numbers 1,396 to 1,403, inclusive

# REISSUES

## JUNE 27, 1972

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

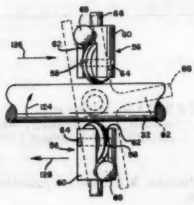
### 27,403
### VARIABLE PITCH LINEAR ACTUATOR

Wenzel Zaruba, East Paterson, N.J., assignor to The Dumore Company

Original No. 3,473,393, dated Oct. 21, 1969, Ser. No. 669,447, Sept. 21, 1967. Application for reissue Jan. 20, 1970, Ser. No. 4,253

Int. Cl. F16h *21/16*

U.S. Cl. 74—25 25 Claims



A variable pitch linear actuator for converting angular rotation to linear movement. The conversion is achieved by providing a plurality of wheels spaced about the periphery of a shaft, with the planes of said wheels being pivotable about axes perpendicular to the shaft.

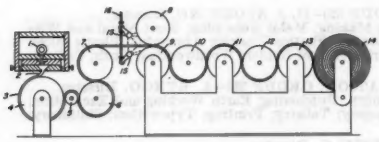
### 27,404
### TRANSPARENT POLYOLEFIN FILMS OF HIGH MODULUS AND CLARITY

Robert F. Williams, Jr., Webster, and Richard H. Jenks, Rome, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Original No. 3,503,843, dated Mar. 31, 1970, Ser. No. 683,064, Oct. 16, 1967, which is a division of Ser. No. 565,305, July 14, 1966, which is a continuation-in-part of Ser. No. 197,217, May 7, 1962, which is a continuation-in-part of Ser. No. 9,567, Feb. 18, 1960, Ser. No. 16,208, Mar. 21, 1960, and Ser. No. 30,324, May 19, 1960. Application Ser. No. 16,208 is a continuation-in-part of Ser. No. 833,666, Aug. 10, 1959, which is a continuation-in-part of Ser. No. 706,626, Jan. 2, 1958. Application for reissue July 31, 1970, Ser. No. 59,959

Int. Cl. B32b *27/32*

U.S. Cl. 161—165 8 Claims



Increased stiffness and better clarity of polymeric films can be obtained by compression rolling relatively thick films of the polymers, provided that the films are coated (at the juncture of the rolls with the film) with enough liquid "lubricant" to form a "hydrodynamic wedge" in the nip area. Films having higher modulus and greater clarity (than could otherwise be produced) can be manufactured by this process. Polyolefin films having such higher modulus plus excellent clarity (less than 3% haze) are claimed.

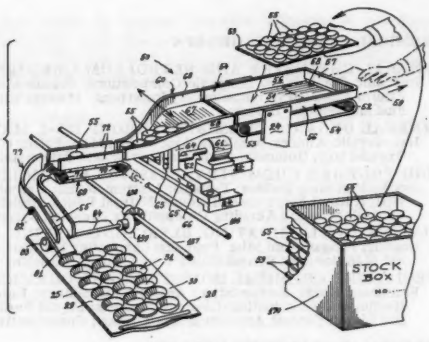
### 27,405
### CANDY PACKAGING MACHINE

Albert L. Ehe and Charles T. Milligan, Queens County, N.Y., assignors to Multicup Automation Company, Inc., Woodside, N.Y.

Original No. 3,389,531, dated June 25, 1968, Ser. No. 484,596, Sept. 2, 1965. Application for reissue June 10, 1970, Ser. No. 45,273

Int. Cl. B65b *35/14, 35/54, 1/02*

U.S. Cl. 53—126 14 Claims




*Two conveyor systems are arranged side by side. A compartmented tray is positioned at predetermined positions on one conveyor. The compartments may be shaped to accommodate candy pieces. Individual pieces of candy are deposited into individual compartments. After the trays have been filled with candy pieces, they are moved into individual boxes which are located on a conveyor.*

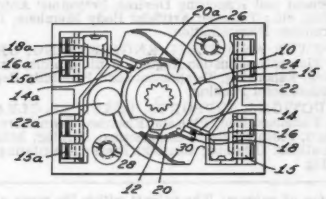
### 27,406
### ELECTRIC SWITCH MECHANISM

Gordon H. Cork, Birmingham, Mich., assignor to Gemco Electric Co., Clawson, Mich.

Original No. 3,474,204, dated Oct. 21, 1969, Ser. No. 677,833, Oct. 10, 1967, which is a continuation-in-part of Ser. No. 625,544, Mar. 23, 1967. Application for reissue Apr. 23, 1970, Ser. No. 31,359

Int. Cl. H01h *1/36*

U.S. Cl. 200—164 R 4 Claims




This disclosure shows switch mechanism wherein the switch comprises cooperating electric contact portions

operable to move into contact with each other to make the circuit or to move out of contact with each other to break the circuit. One contact is a fixed contact and the other contact is a movable contact. When the two contacts are brought into contact with each other the construction is such that one contact has its contact face wiped across relative to the other contact face so as to clean the same and keep the contact faces free from undesirable deposits.

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27,407

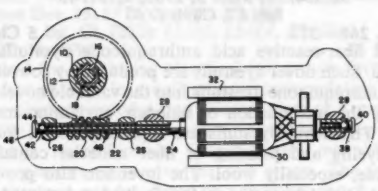
## WINDOW REGULATOR WITH FLEXIBLE SHAFT

Joseph C. Littmann, Temperance, Mich., assignor to Ferro Manufacturing Corporation, Detroit, Mich.

Original No. 3,487,704, dated Jan. 6, 1970, Ser. No. 630,089, Apr. 11, 1967. Application for reissue Mar. 3, 1970, Ser. No. 16,270

Int. Cl. F16h *29/20*

U.S. Cl. 74—89.2 11 Claims



A window regulator for automobiles comprising a motor, a drive shaft composed of a plurality of aligned sections, a resilient torsion member interconnecting the sections at opposite ends of the shaft, and gearing at the output end of the shaft for connection to a window regulator.

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27,408

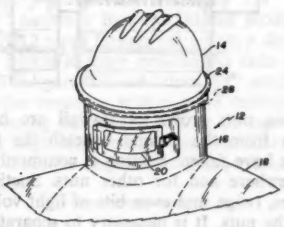
## CLAMP-ON PROTECTIVE HOOD

Herbert A. Raschke, Greenbrae, Calif., assignor to E. D. Bullard Company, Sausalito, Calif.

Original No. 3,427,660, dated Feb. 18, 1969, Ser. No. 591,791, Nov. 3, 1966. Application for reissue Dec. 17, 1969, Ser. No. 888,181

Int. Cl. A61f *9/00*; A62b *7/00*

U.S. Cl. 2—10 11 Claims



A hood attachable to the periphery of the periphery of the rim of a hard safety hat, which hood extends down over the face, neck and shoulders of the wearer to form a protective atmosphere around the wearer's head. A structure for quickly attaching and detaching the hood to the safety hat which structure assures an air tight seal between the hood and the hat to exclude deleterious airborne substances from interior of the hood. An improved system for conveying and distributing air to the interior of the hood.

27,409

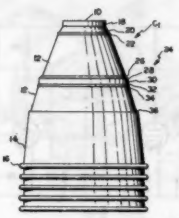
## STACKABLE INSERT CONTAINER FOR AXIALLY SPACED ENGAGING SURFACES

Herbert J. Wanderer, Elmhurst, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.

Original No. 3,232,512, dated Feb. 1, 1966, Ser. No. 366,080, May 8, 1964. Application for reissue Apr. 12, 1967, Ser. No. 637,021

Int. Cl. B65d *21/02, 3/00*

U.S. Cl. 229—1.5 B 14 Claims



*The structure herein described comprises a cup or container of thin wall plastic material adapted to be inserted, frictionally retained, and removed from a supporting holder.*

*The cups or containers, when stacked, form a resilient stack or column from which a cup or container may readily be removed by application of the holder to the stack, to be securely but releasably retained in the holder.*

*Also herein disclosed is the holder to be used with the cups or containers.*

*Also herein disclosed are methods and apparatus for thermoforming the cups or containers from sheet plastic material.*

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27,410

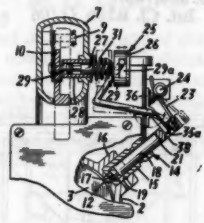
## DECOMPRESSION CONTROL FOR INTERNAL COMBUSTION ENGINE

Albert E. Anderson, Greenwich, Albert K. Newman, Noroton, Chris Schou, Greenwich, and James A. Ransom, Bryam, Conn., and Walter Gorski, Armonk, N.Y., assignors to Textron Inc.

Original No. 3,418,992, dated Dec. 31, 1968, Ser. No. 654,446, July 19, 1967. Application for reissue Dec. 23, 1970, Ser. No. 100,963

Int. Cl. F01l *13/08*

U.S. Cl. 123—182 12 Claims



To facilitate starting, an internal combustion engine is provided with a decompression port located at a selected distance from the top of the cylinder so as to decrease compression during cranking of the engine. The port is controlled by a valve which is normally closed and which preferably comprises a ball shaped valve member pressed against an annular valve seat. A unitary locking element holds the engine throttle control member in selected position for starting and also holds the decompression valve open. As soon as the engine starts, actuation of the throttle control member releases the locking element and thereby results in the automatic closing of the decompression valve.

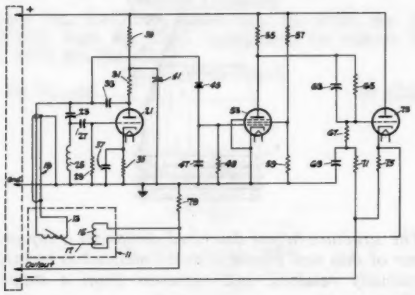
## 27,411
## FORCE MEASURING SYSTEM

**Donald E. Bentley, Minden, Nev., and Robert L. Price, Thousand Oaks, Calif., assignors to Systron-Donner Corporation, Concord, Calif.**

**Original No. 3,057,195, dated Oct. 9, 1962, Ser. No. 708,433, Jan. 13, 1958. Application for reissue Apr. 24, 1970, Ser. No. 31,606**

**Int. Cl. G01l** *1/08*

**U.S. Cl. 73—141 R** **14 Claims**



*Force measuring system having a sensing inductance and a movable force sensitive element for changing the effective Q of said inductance. A servo restoring coil for restoring the movement of said movable element is provided. An oscillator having a transistor with an output terminal is also provided and includes a loading circuit having said inductance coupled to the output terminal and arranged to vary the effective load with changes in the position of said movable element. Feedback means is arranged to cause said variation in said load to change the amplitude of oscillation and means is provided to apply the changes in amplitude to said servo restoring coil to oppose the motion of said movable force sensitive element.*

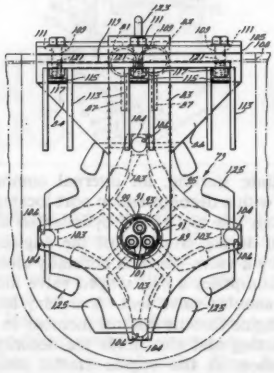
## 27,412
## VIBRATORY FINISHING APPARATUS AND METHOD

**Eugene E. Olson, Addison, Ill., and Harold A. Mickelson, Albert Lea, Minn., assignors to King-Seeley Thermos Company, Ann Arbor, Mich.**

**Original No. 3,371,449, dated Mar. 5, 1968, Ser. No. 516,514, Dec. 27, 1965. Application for reissue Feb. 2, 1970, Ser. No. 884,765**

**Int. Cl. B24b** *31/06*

**U.S. Cl. 51—163** **18 Claims**



*A workpiece finishing device comprising, enclosure means containing an abrasive media, fixture means adapted to support a workpiece during a finishing operation, means rotatably supporting the fixture means about a longitudinal axis, and means for effecting movement of the enclosure means and the fixture means about a preselected path transverse to the axis and for rotating the fixture means about the axis, whereby to move workpieces supported on the fixture relative to the media.*

## 27,413
## 1 - ALKYLAMINO - 4 - ARYLAMINO-ANTHRAQUINONE SULFONIC ACID REACTIVE DYES

**Hans Rudolf Schwander and Jean-Pierre Jung, Riehen, and Peter Hindermann, Bottmingen Basel-Land, Switzerland, assignors to Ciba-Geigy AG., Basel, Switzerland**

**No Drawing. Original No. 3,462,463, dated Aug. 19, 1969, Ser. No. 598,207, Dec. 1, 1966, which is a continuation-in-part of Ser. No. 462,073, June 7, 1965. and Ser. No. 530,351, Feb. 28, 1966. Application for reissue Sept. 1, 1970, Ser. No. 68,806**

**Claims priority, application Switzerland, Apr. 23, 1958, 58,664/58; Mar. 3, 1965, 2,937/65**

**Int. Cl. C09b** *1/40*

**U.S. Cl. 260—372** **5 Claims**

Novel fiber-reactive acid anthraquinone dyestuffs are provided. Such novel dyestuffs are produced by converting amino anthraquinone dyestuffs into the valuable novel dyestuffs by the introduction of halogen, acylamino methyl groups. The novel dyestuffs are especially useful for the batch dyeing and printing of fiber material containing polyamide, especially wool. The invention also provides, as industrial products, the materials dyed and printed with the novel dyestuff.

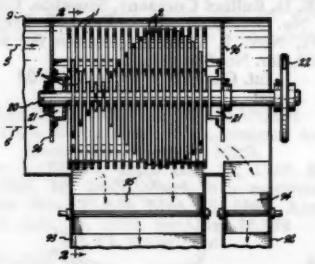
## 27,414
## DEVICE FOR SEPARATING AIR ENTRAINED ARTICLES OF VARYING SIZE

**Merrill N. Musgrave, 1610 E. Boston Terrace, Seattle, Wash. 98102**

**Original No. 3,463,406, dated Aug. 26, 1969, Ser. No. 662,976, Aug. 24, 1967. Application for reissue Feb. 26, 1970, Ser. No. 14,301**

**Int. Cl. B02c** *13/13, 13/288*

**U.S. Cl. 241—51** **15 Claims**



Macadamia nuts grown in Hawaii are harvested by lifting them from the ground beneath the trees, where [they] they have fallen. Suction is commonly employed, as it is elsewhere and for other nuts. Suction picks up husks, leaves, twigs, and even bits of light volcanic rocks, as well as the nuts. It is necessary to separate such trash from the nuts in the simplest and most direct manner, and it is to this object that the present invention is directed. Such separation is effected in the suction duct, wherein all the material picked up passes through a cylindrical cage defined by non-rotative rings spaced axially by a distance approximating the smallest nut it is intended to collect, all such material being acted upon as it starts axially through the cage by a series of generally radially directed rotating blades, the tips whereof extend between adjacent rings, these blades being spaced axially by a distance less than the size of the smallest nut that is to be saved. The relative rotation of the blades and of the rings

tends to effect some breaking up of the trash, while the blades, the leading edges whereof define a helix, advance the nuts that enter at one end towards an exit at the other end. Additionally, yet optionally, non-rotative teeth that lie in planes intermediate the rotating blades will engage bits of trash tending to rotate with the blades, and so will break up the same. Thereby nuts and trash are separated at a single point in the short suction duct, the nuts passing to bins or sacks, and the trash falling upon the ground or being otherwise disposed of. The length of the harvester is thereby kept short, and it is easily maneuverable.

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**27,415**

## PROCESS FOR DEVELOPING WOUND COILS FOR ELECTROMAGNETIC DEVICES

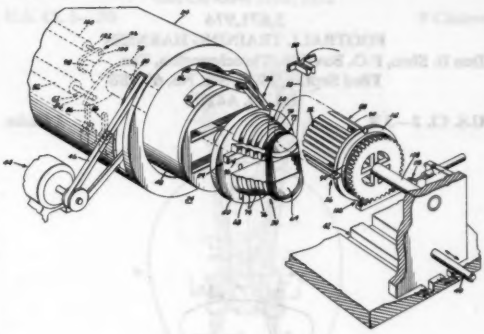
**Arthur S. Cutler, Scotia, N.Y., and Dallas F. Smith, Fort Wayne, Ind., assignors to General Electric Company**

**Original No. 3,522,650, dated Aug. 4, 1970, Ser. No. 812,590, Apr. 2, 1969, which is a continuation-in-part of Ser. No. 594,463, Nov. 15, 1966. Application for reissue Dec. 15, 1970, Ser. No. 98,487**

**Int. Cl. H02k** *15/00, 15/14, 15/16*

**U.S. Cl. 29—596** **16 Claims**

Method for developing electrical coil groups formed of a number of coils in a coil group-accommodating member for ultimate transfer into selected slots of a magnetic core. The coil group-accommodating member is supported adjacent a noncollapsible, longitudinally movable coil form in position to receive the coil group. The coils in each coil group are developed by winding turns of a given coil on the noncollapsible form and concurrently moving some of the turns from the form into the accommodating member where the individual coil groups are finally developed. The noncollapsible coil form is periodically moved longitudinally to produce coils of differing spans during the development of each coil group. *Also the coil-*



*receiving or coil group-accommodating means is positioned with its distal end generally in alignment with the distal end of the coil form to receive generated turns. As the turns are generated about the coil form, the last generated turn moves at least the next adjacent previously generated turn toward the distal end of the coil form.*

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# PLANT PATENTS

## GRANTED JUNE 27, 1972

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

**3,220**

### CHRYSANTHEMUM PLANT

**Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio**

**Filed Oct. 12, 1970, Ser. No. 80,257**

**Int. Cl. A01h** *5/00*

**U.S. Cl. Plt.—74** **1 Claim**

1. A new and distinct cultivar of chrysanthemum characterized particularly in its points of uniqueness compared to the cultivar Yellow Marble by a 5"–6" shorter habit, smaller foliage which is approximately 1½" shorter in length and 1" narrower in width, higher production with approximately 12 more flowers per spray, a deeper yellow flower color which is more resistant to fade under high light and high temperature conditions, ½" smaller flowers, 2–3 days earlier response with a more uniform response within a flowering block, and a trait of heavy budding, which, under high temperature, late summer conditions, can result in a slower response of 3 days as compared to Yellow Marble.

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**3,221**

### CHRYSANTHEMUM PLANT

**Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio**

**Filed Oct. 30, 1970, Ser. No. 85,830**

**Int. Cl. A01h** *5/00*

**U.S. Cl. Plt.—80** **1 Claim**

1. A new and distinct cultivar of chrysanthemum characterized particularly as to uniqueness when compared with the parent cultivar Escapade by its 3"–4" more vigor, 1"–1½" longer foliage, 3–4 days later response, ¾"–1" larger flower, darker flower color, 20 percent more petalage which provides a more solid flower, and slightly more yellow green foliage.

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**3,222**

### GRAPEFRUIT TREE

**Richard A. Hensz, Weslaco, Tex., assignor to Texas A & I University, Kingsville, Tex.**

**Filed Nov. 18, 1970, Ser. No. 90,883**

**Int. Cl. A01h** *5/03*

**U.S. Cl. Plt.—45** **1 Claim**

1. The new and distinct variety of grapefruit tree characterized as to novelty by horticulturally seedless fruit with deep red flesh that stays through maturity, a yellow red-tinted peel with occasional red blushes, a reddish colored albedo, the fruit suited for fresh consumption and for process juice and sectioning, and having a red coloration in the cambium cells.

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**3,223**

### BLUEGRASS PLANT

**Kevin Joseph McVeigh, Somerset, and Cyril Reed Funk, Jr., Milltown, N.J., assignors to Rutgers University, New Brunswick, N.J.**

**Filed Jan. 5, 1971, Ser. No. 104,182**

**Int. Cl. A01h** *5/00*

**U.S. Cl. Plt.—88** **1 Claim**

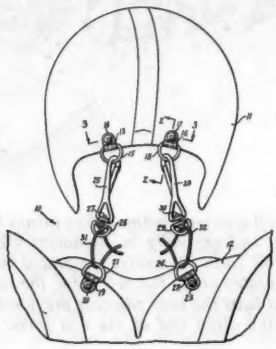
A Kentucky bluegrass plant which exhibits an attractive, fresh, moderately light green color, an upright panicle, and rather small florets and spikelets. The plant produces a dense, upright turf of a unique, soft, velvety texture which has excellent horizontal spreading ability, excellent resistance to stripe smut and moderately good resistance to leaf spot and crown rot.

# PATENTS

## GRANTED JUNE 27, 1972

## GENERAL AND MECHANICAL

**3,671,974**
**FOOTBALL TRAINING HARNESS**
**Don D. Sims, P.O. Box 636, Throckmorton, Tex.**
**Filed Sept. 4, 1970, Ser. No. 69,788**
**Int. Cl. A42b**
**U.S. Cl. 2—3 R** **1 Claim**



A football training harness in which detachable rigid connections adjustable in length extend from the shoulder pads to the rear of the football helmet to prevent hyperflexion and the bending of the head of the player forwardly during blocking and tackling. The connection includes rings secured to the helmet and shoulder pads and swivel snap hooks connected to the shoulder pad rings by means of a wire so as to be adjustable in length, with the snap hooks snaping into the rings fastened to the helmet.

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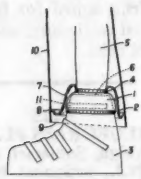
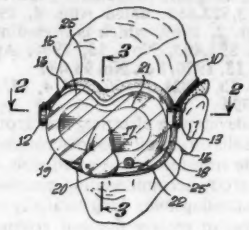
**3,671,975**
**SKI PANTS**
**Werner Vorsteher, Enzesfeld, N.O., Austria, assignor to Anba Sportmode Vorsteher KG, Wien, Austria**
**Filed June 24, 1970, Ser. No. 49,334**
**Claims priority, application Austria, Jan. 16, 1970, 425/70**
**Int. Cl. A41d *1/08***
**U.S. Cl. 2—232** **2 Claims**



Each trouser leg of a ski pants type of garment is provided with a combined windbreak and cuff which provides for improved appearance, wind and snow protection, and flexibility in the area where the trouser legs overlap ski boots. Each windbreak is attached to a lower inside portion of a trouser leg and to an upper band of the cuff. The cuff includes upper and lower bands which limit up and down movements of the cuff when it is in an enclosing position over the top portion of a ski boot.

**3,671,976**
**FULL VIEW DIVER'S MASK**
**Clarence S. Johnson, 4444 West Point Loma Boulevard, San Diego, Calif., and Larry E. McKinley, P. O. Box 647C, Oro Verde Road, Escondido, Calif.**
**Filed Oct. 15, 1970, Ser. No. 81,032**
**Int. Cl. A61f *9/02***
**U.S. Cl. 2—14 C** **4 Claims**



A full view diver's mask having a transparent faceplate member configured to conform to the general contour of a diver's face, carries a peripheral, resilient seal to maintain a sealed relationship. A frontal planar section and a pair of curved portions permit distortion-free frontal and peripheral vision.

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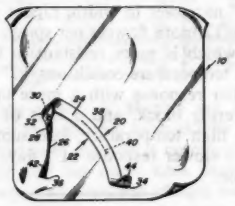
**3,671,977**
**HEADDRESS WITH IMPROVED HEAD ENCIRCLING BAND**
**Julia S. Degnon, 175-39 Dalny Road, Jamaica Estates, N.Y.**
**Filed May 21, 1970, Ser. No. 39,304**
**Int. Cl. A42b *5/00***
**U.S. Cl. 2—207** **1 Claim**

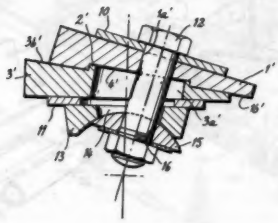


A headdress characterized by two component parts, namely, a head encircling band and strap and a complemental head covering scarf which has a restricted portion stitched or otherwise attached to a median top portion of the band. The band is made up of inelastic and elastic portions with separable and connectible ends provided with quick-separable fasteners. The scarf is made of attractive fabric, is retained in place solely by the band and has loose free flowing ends which can be arranged at will to achieve an eye-pleasing effect.

## 3,671,978
## ANGULAR ADJUSTMENT DEVICES FOR USE IN ARTIFICIAL LIMB MANUFACTURE

Denis Ronald William May, London, England, assignor to J. E. Hanger and Company Limited, London, England

Continuation-in-part of Ser. No. 848,865, Aug. 11, 1969, abandoned. This application Aug. 9, 1971, Ser. No. 170,098
Int. Cl. A61f 1/00, 1/08
U.S. Cl. 3—1 4 Claims

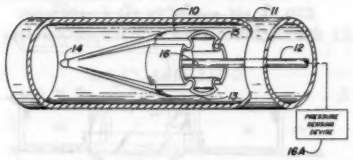


An adjustment means for pre-setting relative angularity between the axes of two parts of an artificial limb or prosthesis comprising wedge shaped discs mutually rotatable about an axis and having inter-engaging eccentric means for imparting a transverse translational movement between the discs upon relative rotation to eliminate variation of axial spacing between the outer surfaces of the discs upon adjustment thereof.

## 3,671,979
## CATHETER MOUNTED ARTIFICIAL HEART VALVE FOR IMPLANTING IN CLOSE PROXIMITY TO A DEFECTIVE NATURAL HEART VALVE

Spyridon Moulopoulos, Athens, Greece, assignor to The University of Utah, Salt Lake City, Utah

Filed Sept. 23, 1969, Ser. No. 860,341
Int. Cl. A61f 1/22; A61b 5/02
U.S. Cl. 3—1 2 Claims

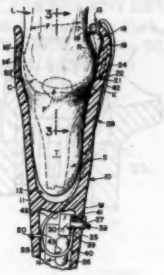


An artificial heart valve for implantation in close proximity to a malfunctioning or damaged natural aortic or mitral heart valve by remote means without performing an open chest or other major surgical operation. The artificial heart valve comprises a flexible membrane in the form of an umbrella in that the apex of the umbrella resides in the direction that blood flow is to be periodically prevented while the distal end opens sufficiently to contact the inner walls of the vessel to prevent the reverse flow of blood and the membrane collapses about the axis of the umbrella to allow the forward flow of blood.

## 3,671,980
## FLUID PRESSURE CLAMP FOR PROSTHETIC APPLIANCE

Lincoln F. Baird, 734 18th Street, Santa Monica, Calif.

Continuation-in-part of Ser. No. 59,480, July 30, 1970, abandoned. This application Feb. 19, 1971, Ser. No. 117,027
Int. Cl. A61f 1/02, 1/12
U.S. Cl. 3—20 9 Claims

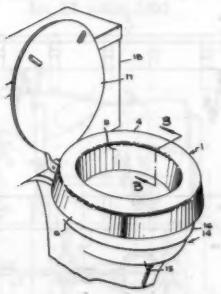


The securing of an artificial limb to an amputated limb by means of a yieldable binding between the artifice and the amputated limb, affording freedom of articulation of a condylar joint therein without chafing of the skin or exerting painful pressures thereto; the yieldable binding being a self-contained built-in fluid pressure wedge with a source of compressible fluid and control means therefor.

## 3,671,981
## INVALID OR GERIATRIC TOILET SEAT

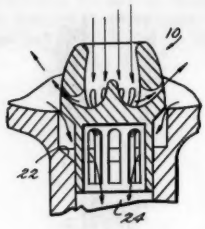
Sarah B. Smith, 2030 Spottswood Road, Charlottesville, Va.

Filed Oct. 20, 1970, Ser. No. 82,305
Int. Cl. A47k 13/00
U.S. Cl. 4—242 7 Claims



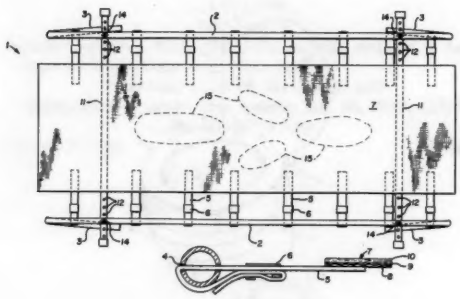
An auxiliary invalid or geriatric seat for toilets for placement on top of a conventional seat to substantially raise the seating level. The auxiliary seat consists of a core having a rigid upper portion and a resilient lower section, with the core being coated with a smooth finish material, at least the lower portion of the coating being flexible to allow the lower surface of the seat to conform to the shape of the surface upon which it is placed to stabilize the auxiliary seat in position upon the conventional seat. The center of gravity may be lowered to increase stability by enclosing a weighted member within the lower inner edge of the seat.

3,671,982
**DRAIN PLUG**
James Norman Sayles, 909 Robidoux Street, St. Joseph, Mo.
Filed Jan. 21, 1971, Ser. No. 108,397
Int. Cl. A47k 1/14
U.S. Cl. 4—295 7 Claims




The drain plug is provided with a tubular lower section for insertion into the opening of a drain pipe; the tubular section is provided with one or more flow passages and a cross-sectional dimension such that the exterior wall of the section will frictionally engage the interior wall of the drain pipe; the upper portion of the plug is provided with flow deflecting surfaces arranged so that, when a stream of water is directed against the surfaces, the flow will be directed in a spray pattern upwardly and outwardly from the drain plug towards the top edge of the basin to wash down walls of the basin.

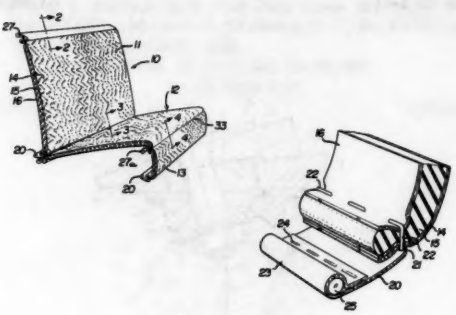
3,671,983
**PROLONGED BED CARE FRAME**
Doris Y. Bertolet, R.D. #1, Oley, Pa.
Filed Aug. 21, 1970, Ser. No. 65,887
Int. Cl. A61g 7/10, 1/00
U.S. Cl. 5—82 1 Claim



A bed frame for prolonged care of invalids, which frame is constructed to relieve pressures on certain parts of the body to support the lumbar region and maintain alignment of the spinal column and legs and to allow air circulation to reduce or prevent ulcers.

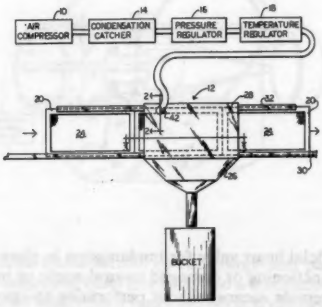
A pair of side frame members are curved vertically to conform to the shape of the back of the invalid. A pad of canvas and sheepskin is stretched between said members by lateral adjusting rods for adjusting the distance between the side frame members. Portions of the pad are cut-out to provide ventilation and reduce the chance of ulcers and patient discomfort.

3,671,984
**UPHOLSTERY EDGING**
Jere B. Ambrose, Pontiac, Mich., assignor to Northern Fiber Products Company, Birmingham, Mich.
Filed July 12, 1971, Ser. No. 161,643
Int. Cl. B32b 3/24; A47c 27/08
U.S. Cl. 5—353.1 9 Claims



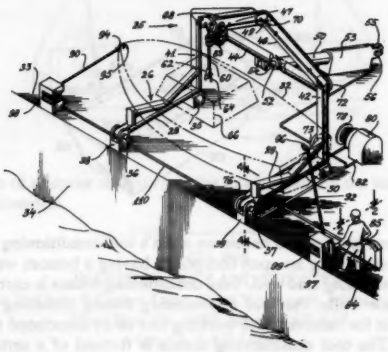
An upholstery edging formed of a thin, narrow relatively stiff, linearly oriented polypropylene fiber, randomly oriented, cloth strip, which is stretch resistant in all of its planar directions, stitched to and extending the length of an edge of an upholstery cover fabric which is to be fastened to another element, with the strip being double bent along the line of stitches to form a double ply, and with the free edge of the outer ply being bent over into a continuous tubular portion for receiving an elongated stiffening rod therein.

3,671,985
**METHOD FOR EXTRACTING HONEY**
William Roland Bell, 804 25th Street, Snyder, Tex.
Division of Ser. No. 794,059, Jan. 27, 1969, Pat. No. 3,535,721, Continuation-in-part of Ser. No. 621,397, March 2, 1967, abandoned. This application July 15, 1970, Ser. No. 55,108
Int. Cl. A01k 59/02
U.S. Cl. 6—12 A 8 Claims



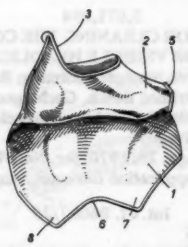

Honey is removed from the honeycomb by blowing a small jet of air into the cells of the honeycomb, thus blowing the honey therefrom.

**3,671,986**
**APPARATUS AND METHOD FOR LAUNCHING AND RECOVERING A SMALL BOAT**
**Allen A. Peters, 49 Waterside Parkway, Staten Island, N.Y.**
**Filed Jan. 2, 1970, Ser. No. 262**
**Int. Cl. B63b *23/02***
**U.S. Cl. 9—39** **3 Claims**



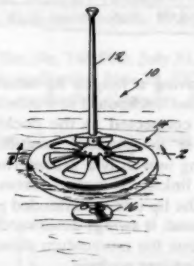
Apparatus for launching and retrieving a boat comprises a frame rotatably mountable on the deck of a vessel. The frame has rails defining a cradle for the boat. The rails are integrally joined to davit posts and crossbeams to form a rigid frame structure. An electrically operable ram is connected to the frame for rotating it on a horizontal axis. A cable is entrained on sheaves carried by the frame and terminates in a hook suspeneded from an arm over the boat. The other end of the cable is engaged by a motor driven winch to retract and to play out the cable. The boat can be provided with a centrally located sling engageably by the hook for hoisting the boat while the frame is rotated to shift the boat laterally. Spring loaded spring lines for steadying the boat can be provided. The ram and motor are operable automatically by a control circuit in predetermined launching and retrieval cycles. The boat can be provided with shiftable water ballast or mechanical balance means. The frame may have two arms supporting two cables for engaging spaced points on the boat to hoist it horizontally.

**3,671,987**
**SWIMMER'S SHOE**
**Jean Mayor, Lausanne, Switzerland, assignor to Materiaux S.A., Lausanne, Canton of Vaud, Switzerland**
**Filed March 10, 1970, Ser. No. 18,053**
**Claims priority, application Switzerland, March 13, 1969, 3829/69**
**Int. Cl. A63b *31/10***
**U.S. Cl. 9—309** **5 Claims**



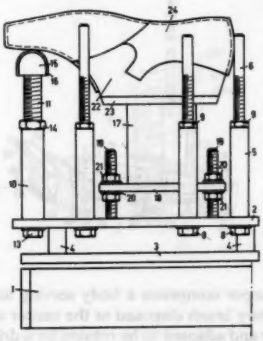
A swimming shoe adapted especially to aid in the performance of the breast stroke comprising: a sole, means for attaching the sole to the foot of the wearer and a scoop-shaped fin extending from the underside of the sole. The joint between the fin and the sole extends in substantially the same direction as the longitudinal axis of the sole, and the scoop portion of the fin opens towards the inward side of the wearer's foot.

**3,671,988**
**AQUATIC AMUSEMENT DEVICE**
**Yetty Newman, 910 Park Avenue, New York, N.Y.**
**Filed Dec. 16, 1970, Ser. No. 98,726**
**Int. Cl. A63b *35/10***
**U.S. Cl. 9—349** **11 Claims**



An inflatable amusement device used for supporting and propelling an individual across the surface of a body of water having a vertical shaft with foot rests on one end and a water engaging member at the other end resiliently linked to a ring shaped buoyant tube.

**3,671,989**
**SUPPORT FOR A LAST USED IN A DEVICE FOR MOLDING SHOE SOLES**
**Petrus R. Deryck, Oordegem, Belgium, assignor to ACEC Atelius de Constructions Electriques de Charleroi, Charleroi, Belgium**
**Filed Oct. 12, 1970, Ser. No. 79,945**
**Claims priority, application Belgium, Sept. 16, 1969, 80373**
**Int. Cl. A43d *3/00***
**U.S. Cl. 12—123** **5 Claims**

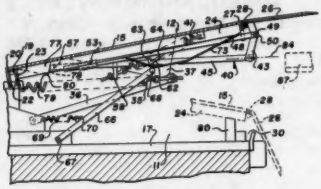


A support for a last used in the molding of shoe soles. The support includes means for positioning the last with respect to the support and magnetic means associated with the support and the last for securing the last to the support. The magnetic means includes a magnet secured to the support and a piece of magnetic material fixed on the side of the last opposite to the sole. The last is made of non-magnetic material.

## 3,671,990
## SELF-EXTENDING DOCKBOARD

Adrian P. Hovestad, 986 Garden City Road, Richmond, British Columbia, Canada

Filed June 23, 1970, Ser. No. 48,994
Int. Cl. B65g *11/00*
U.S. Cl. 14—71 14 Claims

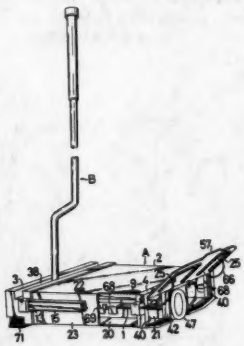


A dockboard having a hinged lip which normally hangs down and retains the dockboard in a substantially horizontal position. Linkage connected to the dockboard and the lip locks the latter in its pendent position, and when the dockboard is swung upwardly a predetermined distance and then lowered, the linkage is moved across a toggle line and thereafter swings the lip into an extended position. When the dockboard is released, it swings downwardly until it hits stop means, at which time the momentum causes the lip to swing back towards the pendent position.

## 3,671,991
## CARPET SWEEPER

Hiroshi Fukuba, 2-320-82 Matsugaoka, Nagariyama, Chiba, Japan

Filed Oct. 12, 1970, Ser. No. 79,915
Claims priority, application Japan, Oct. 13, 1969, 44/96752; June 18, 1970, 45/52416
Int. Cl. A47l *11/33*
U.S. Cl. 15—41 13 Claims

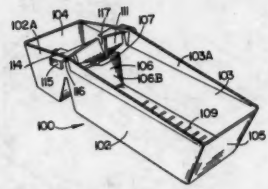


A carpet sweeper comprises a body serving as a dust container and a rotary brush disposed at the center of lower portion of the body and adapted to be rotated by a driven wheel in frictional contact with wheels to be driven on the floor so as to sweep dust off the floor into the dust container. The dust container is defined by a case open at its opposite ends and two side frames integrally fixed to the ends of the case. A pair of the front and rear wheels and the driven wheel disposed therebetween are mounted on one of the side frames, while the other side frame is provided with dust outlets and a cover plate for covering the outlets. The cover plate is opened and the body is inclined for dust disposal.

## 3,671,992
## ARTIST'S TOOL & CONDITIONING STRUCTURE

Harrison K. Linger, 7412 Springvale Drive, Louisville, Ky.

Continuation-in-part of Ser. No. 866,471, Oct. 15, 1969. This application Sept. 4, 1970, Ser. No. 69,565
Int. Cl. B44d *3/00*
U.S. Cl. 15—104.92 19 Claims



There is disclosed herein an artist's tool conditioning structure comprising an open receptacle having a bottom wall and an upstanding side wall. Tool conditioning means is carried by the side walls; the tool conditioning means including a slot therein for receiving the working end of an associated artist's tool. The tool conditioning means is formed of a semi-rigid material whereby opposed inward pressure on the tool conditioning means in the direction of the slot causes constriction of the slot and the application of compressive force on the end of the associated artist's tool in the slot, whereby longitudinal movement of the end of the associated artist's tool through the constricted slot results in the squeezing out and removal of waste materials on the working end of the associated artist's tool.

## 3,671,993
## SWAB TOOL FOR TEST TUBES

Seth Morris Smedstad, 4612-102 Avenue, Edmonton, Alberta, Canada

Filed Jan. 15, 1971, Ser. No. 106,790
Int. Cl. A47l *13/16*
U.S. Cl. 15—211 2 Claims

A semi-rigid, moisture-absorbent swab tool is provided for drying a test tube. The swab has a diameter slightly larger than that of the test tube. When forced into the tube it wipes it dry using a single push-pull operation.

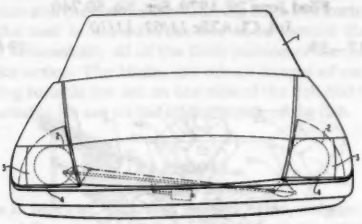
## 3,671,994
## INSTALLATION FOR CLEANING THE COVER PANES OF MOTOR VEHICLE HEADLIGHTS

Werner Breitschwerdt, Stuttgart-Botnang; Rudolf Andres, Sindelfingen, and Gerhard Busch, Gechingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Untertwerkheim, Germany

Filed Aug. 26, 1970, Ser. No. 67,140
Claims priority, application Germany, Aug. 29, 1969, G 69 34 013.2
Int. Cl. B60s *1/38*
U.S. Cl. 15—250.36 14 Claims

A cleaning installation for cleaning the cover panes of motor vehicle headlights by means of wipers adapted to move over the surfaces of the cover panes, in which the wipers, normally wiping a circular sector, are of such length that they can

be visually observed from the vehicle interior space during a part of their movement when they project above the upper



edge of a fender structure or the like into which the headlights are inserted.

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**3,671,995**

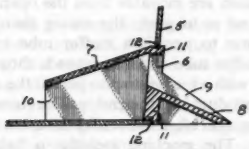
**WASTE BASKET AND THE LIKE**

**Alton F. Carr, 8 Cutter Lane, West Yarmouth, Mass.**

**Filed Dec. 16, 1970, Ser. No. 98,657**

**Int. Cl. A47l *13/52***

**U.S. Cl. 15—257.1** **8 Claims**



A container such as a waste basket is disclosed as having a transverse slot a short distance above its bottom. The container wall includes an inward projection overlying the slot and shaped and dimensioned to minimize the chances of articles entrant of the container through its open end escaping through the slot and a projection extending outwardly and downwardly from the bottom edge of the slot with its free edge resting on the floor, the outward projection being a collecting and guiding channel along which dirt may be swept. The projections are shown as parts of a slot-defining frame that is snapped into a transverse slot in the wall of the container.

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**3,671,996**

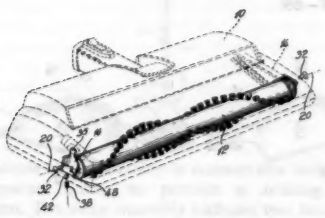
**ROTARY BRUSH ADJUSTMENT DEVICE FOR VACUUM CLEANER ATTACHMENT**

**Paul Emile Gaudry, 40 Ouimet Street, Laval des Rapides, Quebec, Canada**

**Filed Nov. 2, 1970, Ser. No. 86,139**

**Int. Cl. A47l *9/04***

**U.S. Cl. 15—368** **8 Claims**



A device for adjusting the level of a rotary brush mounted inside the housing of a vacuum cleaner attachment including a driving member mounted for rotation in the housing at one end of the brush and a driven member also mounted for rotation in the housing at the other end of the brush. A stationary shaft is eccentrically connected at each end thereof to the driving and driven members for transmitting the rotary movement imparted by the driving member to the driven member so as to simultaneously vary the level of both ends of the stationary shaft. The brush is mounted for rotation of the stationary shaft and the level thereof is adjusted by the movement of the stationary shaft.

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**3,671,997**

**SLIDE SHOE STRUCTURES OF SYNTHETIC PLASTIC MATERIAL FOR SLIDING ROOFS OF MOTOR VEHICLES**

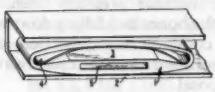
**Gerhard Sigmund, Stuttgart-Vaihingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany**

**Division of Ser. No. 748,990, July 31, 1968, Pat. No. 3,558,183. This application June 24, 1970, Ser. No. 49,427**

**Claims priority, application Germany, Aug. 3, 1967, P 16 30 330.3**

**Int. Cl. E05d *13/02*; B60j *7/04***

**U.S. Cl. 16—93** **6 Claims**



A slide structure made from synthetic plastic material for sliding roofs of motor vehicles, which slides in profile members and is provided with an aperture or recess within which is arranged at least one prestressed spring.

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**3,671,998**

**HINGES THAT TAKE TO PIECES**

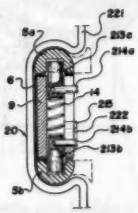
**Jose Antonio Ruiz, 75 rue des Chantiers, Le Havre Graville, France**

**Filed Dec. 22, 1970, Ser. No. 100,594**

**Claims priority, application France, Dec. 23, 1969, 6944681**

**Int. Cl. E05d *1/06***

**U.S. Cl. 16—176** **7 Claims**



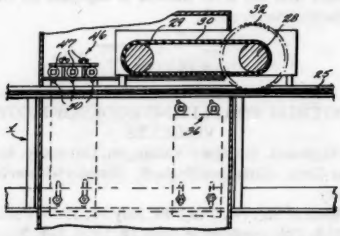
A hinge that takes to pieces, comprising a male and a female part which move around an axis. The male part comprises two retractable pivots which can be inserted into a corresponding housing in the female part. The pivots are separated by a compression spring. Each pivot is joined to a pin sliding in an oblong hole in the cylindrical body of the male part. This oblong hole has a slot to block the pin on each pivot in the locking position for taking the hinge to pieces.

3,671,999

## APPARATUS FOR RECOVERING MEAT FROM BONES

Frank R. Downs, Estherville, Iowa, assignor to Francis L. Downs, Esterville, Iowa

Filed July 14, 1970, Ser. No. 54,674
Int. Cl. A22c 17/04
U.S. Cl. 17—1 G 6 Claims



A horizontally disposed chain wire-link endless belt conveyor receives the poultry pieces to be treated and moves the same beneath a flexible imperforate hold-down endless belt conveyor and while the pieces being treated are still on the chain wire-link endless belt conveyor directing thereonto water-jets under suitable pressure from above; the meat separating from the bones and falling downwardly through the chain wire-link conveyor for collection and the separated bones moving over the end of the chain wire-link endless belt conveyor for disposal.

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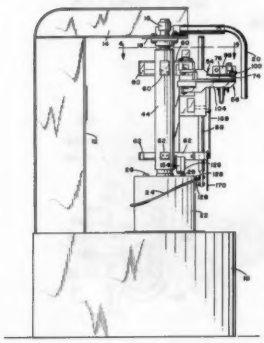
3,672,000

## MACHINE TO DE-BONE CHICKEN THIGHS

Eugene G. Martin, Stevens, and Edwin C. Mohler, Willow Street, both of Pa., assignors to Victor F. Weaver, Inc., New Holland, Pa.

Filed Aug. 31, 1970, Ser. No. 68,260
Int. Cl. A22c 21/00, 17/04
U.S. Cl. 17—11 20 Claims



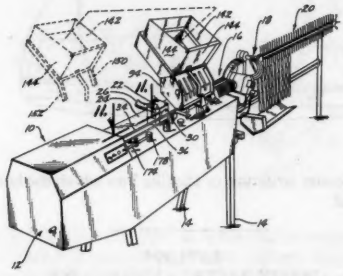
A machine for removing the bone from chicken thighs by engaging the ball at one end of the thigh bone and moving stripper members into engagement with the thigh bone immediately below the gripping means, and effecting longitudinal movement between the gripping means and the stripper members until the stripper members move the full length of the bone and engage and move around the ball at the opposite end of the thigh bone, to complete the removal of the meat from said bone.

3,672,001

## PRODUCT ENCASING MACHINE

Charles Austin Greider, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed June 29, 1970, Ser. No. 50,740
Int. Cl. A22c 11/02, 11/10
U.S. Cl. 17—33 19 Claims



A product encasing machine comprising an adjustable hopper for product casings, the hopper being positioned above a clamp means comprising front and rear V-shaped seats. The front and rear seats are adapted to receive one casing at a time from the hopper when in their open position. The front and rear seats are movable from the open position to a closed position so as to grasp the casing therebetween and position the same to permit a stuffer tube to be inserted therein. The stuffer tube slidably extends through and is in communication with a meat pump to permit the stuffer tube to inject the meat product into the casing. The clamp seats return to their open position after the stuffer tube has been inserted into the casing. The machine includes a linking assembly which links the product into uniform links. A looping assembly automatically deposits the links in uniform loops on a take-away conveyor. A cam follower rod is slidably mounted below the stuffer tube and has a casing follower mounted thereon which moves along the stuffer tube and engages one end of the casing to compress the casing before it is rotated and to maintain uniform pressure on the casing as the meat product is encased in the casing. A counterbalanced arm member extends through the front clamp seat and prevents the closing movement thereof to prevent recycling of the machine unless a casing is positioned thereon. Means is provided to prevent damage to the fragile casings as they are being handled by the machine. Means is also provided for precisely controlling the operation of the stuffer tube, cam follower rod and casing clamp so that the machine properly cycles to automatically produce a uniformly encased product.

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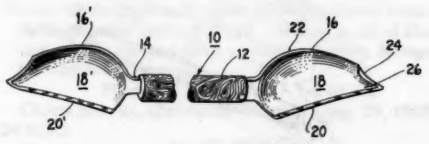
3,672,002

## FISH CLEANING AND FILLETING DEVICE

Melvin C. Penman, 560 Heim Road, Getzville, N.Y.

Filed June 29, 1970, Ser. No. 50,848
Int. Cl. A22c 25/16
U.S. Cl. 17—69 7 Claims



A hand tool having a handle with a concave blade at each end and a method for obtaining a skinless, boneless one piece fillet. The blade includes a linear shearing edge and a curvilinear shearing edge conforming to the rib cage of a fish, the

edges converging to an apex. The apex of the blade may be inserted in a slit along the backbone of the fish terminating in a transverse slit at the tail. With the concavity facing toward the tail, the linear shearing edge bearing against the inner surface of the skin and the curvilinear shearing edge embracing the rib cage, the tool is moved from the head toward the tail to remove substantially all of the flesh portion of the fish with a plow-like action. The blades are mirror images of each other, one being suitable for use on one side of the fish and the other blade suitable for use on the opposite side of the fish.

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**3,672,003**
**CABLE STRAP**

**Thomas E. Morgan, Cleveland Heights, Ohio, assignor to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed July 9, 1970, Ser. No. 53,474**
**Int. Cl. B65d *63/00***
**U.S. Cl. 24—16 PB** **6 Claims**

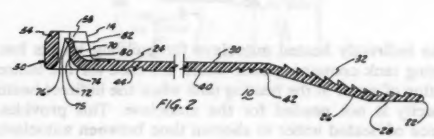

FIG. 2

The cable tie has an elongated, unitary, flexible strap with an enlarged head at one end. An opening in the head allows the remote strap end to be threaded through the opening in the head to clamp a bundle of wires or the like within the loop so formed. The strap body has an integral flexible pawl extending into the opening to lockingly engage inset ratchet teeth in the strap body adjacent the remote end of the strap.

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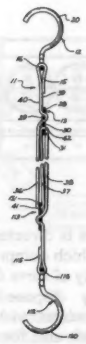
**3,672,004**
**ADJUSTABLE STRAP**

**Thomas R. Smith, Newton, Iowa, assignor to Pyramid, Inc., Newton, Iowa**

**Filed Oct. 8, 1970, Ser. No. 79,167**
**Int. Cl. A44b *21/00, 11/02***
**U.S. Cl. 24—73 HH** **7 Claims**

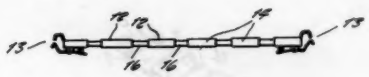


An adjustable strap assembly is connectable between two variably spaced points to provide a holding tension therebetween. The strap assembly includes two buckles and an elongated belt connected to the buckles to provide three strands between the buckles. The relative spacing between the buckles is selectively adjustable to alter the effective length of the strap assembly.

**3,672,005**
**EXPANDABLE COLLAR CLASP**

**Wayland F. Barber, P.O. Box 34, Black Creek, N.Y.**

**Filed Oct. 20, 1970, Ser. No. 82,271**
**Int. Cl. A44b *21/00*; F16g *13/22***
**U.S. Cl. 24—81 D** **2 Claims**



A collar clasp which straddles the space between the collar tabs of a gentleman's shirt, the clasp retaining the tabs in a neat and attractive appearance, the clasp comprising an expandable, spring loaded, link chain with a clip at each opposite end thereof for grasping the collar tabs.

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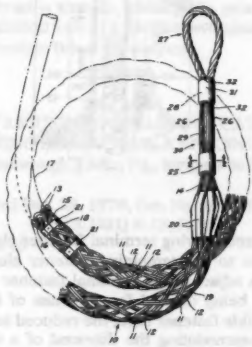
**3,672,006**
**OPEN MESH CABLE GRIP**

**Alfred W. Fidrych, Stonington, Conn., assignor to Harvey Hubbell Incorporated, Bridgeport, Conn.**

**Filed Oct. 23, 1970, Ser. No. 83,475**
**Int. Cl. F16g *11/02***
**U.S. Cl. 24—123 F** **14 Claims**

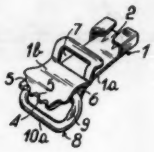


An open mesh wire cable grip having a grip body composed of paired strands woven over one and under one at the cable receiving end thereof and in certain cases at also the draft end thereof, and woven over two and under two between the ends thereof. The strands at the draft end of the grip body are gathered into a plurality of branches which form the shoulder of the grip, and these branches are further divided into two groups which are bound together with the ends of the draft loop by two steel bands to form a stiffened draft shank. The outermost band forming such shank is enclosed by a tube of heat shrinkable plastic to cover any protruding strand ends. The plastic tube may be provided with a distinctive color, or an additional distinctively colored sleeve may be secured to the grip's draft end to designate the size of the grip.

## 3,672,007
## SLIDER BUCKLE FOR STRAPS AND THE LIKE

Adalberto Steinberg, Via Angelo Inganni 79, and Silvio Ricco, both of Milan, Italy

Filed June 29, 1970, Ser. No. 50,665
Claims priority, application Italy, July 18, 1969, 19827 A/69
Int. Cl. A44b 11/10
U.S. Cl. 24—196 1 Claim

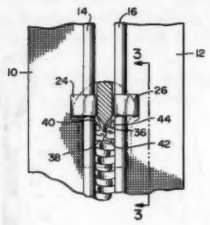


A slider buckle in which the buckle is fixed to one end of the strap and has a structure defining two windows into which the free end of the strap is inserted and fixed.

## 3,672,008
## SLIDE FASTENER STOP ASSEMBLY

George B. Moertel, Conneautville, and James R. Wilson, Conneaut Lake, both of Pa., assignors to Textron Inc., Providence, R.I.

Filed May 4, 1970, Ser. No. 34,340
Int. Cl. A44b 19/36, 19/12
U.S. Cl. 24—205.11 F 10 Claims

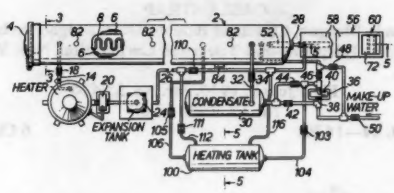


A slide fastener having terminal fastener elements reduced in size relative to the remaining fastener elements and two stop members adjacent the terminal fastener elements, each stop member being formed from a mass of fusible material fused onto a slide fastener tape, the reduced terminal fastener elements accommodating the diamond of a slider when the slider engages the stop members to prevent splay of the slide fastener tapes. A method of forming the above described slide fastener including supporting a slide fastener chain to expose the terminal fastener elements, reducing the size of the terminal fastener elements, and fusing a mass of fusible material onto each slide fastener tape to form the stop members. Apparatus for forming the above described slide fastener including a support block having parallel channels for receiving separate slide fastener tapes, a forming anvil having a pair of spaced legs movable in the channels to capture the terminal fastener elements in cavities therein, a source for supplying ultrasonic energy to the forming anvil to reduce the size of the terminal fastener elements, a forming block supporting the separated slide fastener tapes adjacent cavities defined therein by another forming anvil, a forming member engaging the forming block to move the forming block relative to the other forming anvil and shear blanks of fusible material in the cavities, and a source for supplying ultrasonic energy to the forming member to fuse the blanks onto the slide fastener tapes to form separate stop members.

## 3,672,009
## METHOD OF AUTOCLAVING BUILDING BLOCKS

John W. Pike, New Rochelle, N.Y., assignor to Struthers Scientific and International Corporation

Division of Ser. No. 698,264, Jan. 16, 1968, Pat. No. 3,535,407. This application Oct. 20, 1970, Ser. No. 82,360
Claims priority, application Canada, Jan. 12, 1968, 009776The portion of the term of this patent subsequent to Oct. 20, 1987, has been disclaimed.
Int. Cl. B01j 3/00
U.S. Cl. 25—133 1 Claim

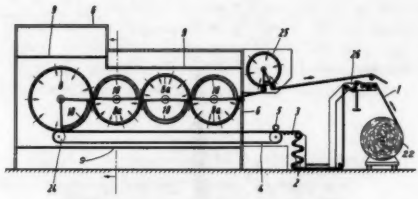



An indirectly heated autoclave for building blocks has a heating tank containing coils which are used for the indirect heating of water in the heating tank when the indirect heating capacity is not needed for the autoclave. This provides a source of heated water to shorten time between autoclaving cycles.

## 3,672,010
## APPARATUS FOR THE CONTINUOUS TREATMENT OF TEXTILE MATERIALS

Heinz Fleissner, Egelsbach near Frankfurt/Main, Germany, assignor to Vepa AG

Division of Ser. No. 831,686, June 9, 1968, Pat. No. 3,521,378, which is a continuation-in-part of Ser. No. 654,728, July 20, 1967, Pat. No. 3,503,134. This application Nov. 21, 1969, Ser. No. 877,565
Claims priority, application Germany, June 8, 1968, P 17 60 604.1; June 22, 1968, P 17 60 717.9; June 27, 1968, P 17 60 751.1; April 8, 1969, P 19 17 757.2
Int. Cl. D06c 3/02; F26b 3/06, 13/30
U.S. Cl. 26—60 5 Claims

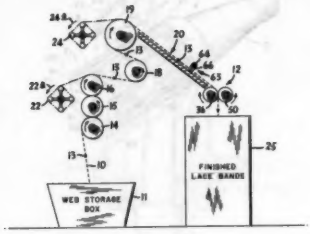


The present disclosure is directed to an apparatus for the treatment of materials which comprises a heat-insulated treatment chamber, a plurality of sieve drum means subjected to a suction draft rotatably disposed within said treatment chamber, fan means associated with the sieve drum means for producing a suction draft and for circulating the treatment medium in said treatment chamber, heating means provided in the circulation zone of the treatment medium, tentering means containing tensioning chains at least partially disposed outside of the treatment chamber serving as inlet means for said material, said tentering means cooperating with the sieve drum means for the effective conveyance of the material being treated to avoid shrinkage within said treatment chamber and outlet means for removing the material being treated from the treatment chamber.

## 3,672,011
## APPARATUS FOR SEPARATING A WEB OF LACE INTO INDIVIDUAL BANDS

Richard M. Neth, Dallas; John M. Rogers, Shavertown, and James J. Gallagher, Kingston, all of Pa., assignors to Indian Head Inc., New York, N.Y.

Filed Oct. 30, 1970, Ser. No. 85,366
Int. Cl. D02g 3/00
U.S. Cl. 28—1 CS 4 Claims

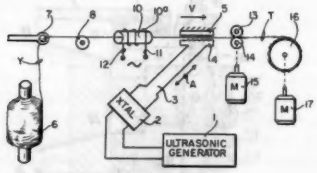



A machine for separating a web of lace into individual bands includes at one end a pair of drive rollers for pulling the material through the machine, and at the other end a set of tensioning rollers for retarding the free movement of the material through the machine. A plurality of idler rollers guide the material in its travel between the tensioning and drive rollers. The lacers holding the individual bands of lace together as a web are stripped from the web and wound on one or more take-up reels. As the material is drawn through the machine, the reels are rotated to continuously rip the lacers from the web of material thus separating the web into individual bands.

## 3,672,012
## APPARATUS FOR TEXTURIZING YARNS AND THE LIKE

Glenn A. Burklund, 3903 Carolyn Avenue, Fairfax, Va.

Filed July 30, 1970, Ser. No. 59,506
Int. Cl. D02g 1/00
U.S. Cl. 28—1.2 11 Claims

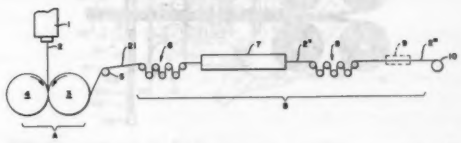



Improved technique for texturizing synthetic filaments, fibers and yarns by the application of high frequency impact thereto to impart bulk and/or stretch characteristics, each impact being applied to the yarn at an acute angle with respect to its axis and in such a way that each fiber or filament is peened asymmetrically on one side to cause curling or bending while at the same time being advanced through the texturing zone by the impact, and between impacts the yarn is fully released by the impact applying members in the zone so that the yarn can assume a relaxed position whereby any build up of twisting of the yarn is avoided.

## 3,672,013
## APPARATUS FOR PRODUCTION OF POLYMER FIBERS

Brian J. Vernon, Timperley, and Wladyslaw H. Skoroszewski, Davyhulme, Manchester, both of England, assignors to Shell Oil Company, New York, N.Y.

Filed April 9, 1969, Ser. No. 814,768
Claims priority, application Great Britain, April 10, 1968, 17,237/68
Int. Cl. D01d 13/00; B29d 7/14
U.S. Cl. 28—71.3 1 Claim

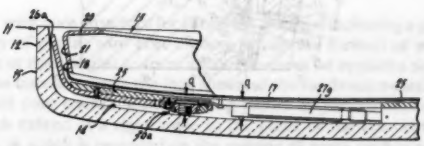


Synthetic fibers, such as polypropylene fibers, are manufactured in a form in which the fibers are of regular dimensions and substantially free from whiskery appendant fibrils, by a controlled fibrillation method which comprises impressing in a web of the polymer composition at a temperature above its crystalline melting point a plurality of grooves disposed in close but spaced-apart relationship to the longitudinal direction of the web by passing the web at said temperature between two rollers having non-yielding surfaces, e.g. steel rollers, at least one of which bears closely spaced, parallel surface ridges each having inwardly directed sides leading to peaks which are rounded off to a small radius, the sides of adjacent ridges forming troughs, chilling the grooved web, and subjecting the chilled web to a fibrillation treatment including stretching said web to orient the polymer.

## 3,672,014
## METHOD OF MOUNTING A MASS IN A CATHODE-RAY TUBE USING RETRACTABLE SPACING UNITS

Laurence B. Kimbrough, Lititz, Pa., assignor to RCA Corporation

Filed Dec. 24, 1970, Ser. No. 101,315
Int. Cl. H01j 9/18, 9/36
U.S. Cl. 29—25.15 9 Claims

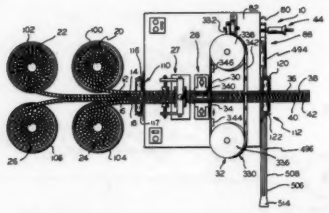


The method includes positioning a mask-frame assembly in predetermined spaced relation with the inner surface of a faceplate of a cathode-ray tube by means of at least four retractable spacing units. The spacing units are each extended a predetermined fixed distance, and the mask-frame assembly is mounted in the panel. Then the spacing units are retracted to allow the mask to be self-supporting in the panel, and the spacing between the mask and the face-plate is measured at discrete positions without removing the retracted spacing units.

## 3,672,015
## APPARATUS FOR PROCESSING FLEXIBLE METALLIC CONDUIT

William J. Fisher, Lisle, Ill., assignor to Maynard Braverman, Chicago, Ill., a part interest

Filed Jan. 9, 1970, Ser. No. 1,735
Int. Cl. B21b *15/00*; B23p *23/04*, *25/00*
U.S. Cl. 29—33 K 7 Claims

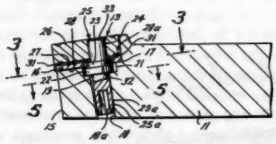


A machine and method for mechanically and simultaneously sizing and cutting multiple strands of flexible metallic conduit to desired lengths, and for facilitating the application of a fitting to either end of the respective resulting lengths, in which the conduit is simultaneously drawn, by a roller drive, from a number of rolls of same in parallel strands and is fed past a cutting station the conduit length desired, after which feeding of the conduit strands ceases and the conduit lengths are simultaneously severed from the row of strands by sawing. The machine includes a device for mechanically rotating the individual end fittings for the conduit length ends, whereby the machine operator can individually manipulate the individual conduit length ends to apply same to the device to permit the end fitting for same to be mechanically rotated into its fully seated position in the conduit end, and an attachment that permits the conduit wiring to be mechanically fed into same and cut off at the right length to complete the conduit assembly.

## 3,672,016
## INDEXABLE BIT CUTTING TOOL HOLDER

Arthur A. Melinder, 10006 Hanka, Houston, Tex.

Filed March 3, 1970, Ser. No. 16,046
Int. Cl. B26d *1/00*
U.S. Cl. 29—96 4 Claims

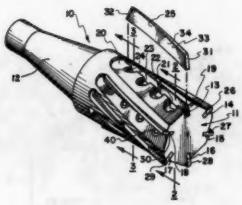


An indexable bit cutting tool holder includes a shank which is provided with a recess at one end thereof for receiving an indexable bit cutting tool. A locking arrangement is provided for locking the indexable bit cutting insert or tool in position on the holder in a manner so that the bit cutting tool can be used to cut in more than one direction. The locking arrangement is such that a maximum surface contact inhibits loosening of the insert. An anvil is also provided on which the indexable bit cutting tool is adapted to be seated, the anvil having raised edges along one surface so that only the edges of the bit cutting tool are engaged and supported thereon to inhibit chipping or otherwise damaging the bit cutting tool.

## 3,672,017
## HELICAL BLADE MILLING CUTTER

Waldemar R. Nielsen, Ojai, and Charles D. Mathias, Goleta, both of Calif., assignors to Industrial Tools, Inc., Ojai, Calif.

Filed June 15, 1970, Ser. No. 46,031
Int. Cl. B26d *1/12*
U.S. Cl. 29—105 1 Claim

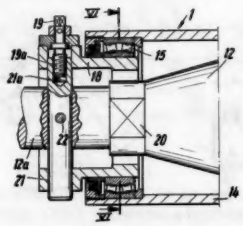


A helical blade milling cutter has a plurality of spiral slots formed in the tool body periphery for retaining helical cutter blades. Retaining sockets open into each slot and are shaped to position clamps. Each clamp has a cylindrically shaped block with a edge shaped face formed with a pair of tapered locking ribs separated by a shallow recess and an adjustment element which may be moved to simultaneously force the block into its associated socket and urge the locking ribs into tight, tow-point or two line locking engagement against the blade.

## 3,672,018
## GUIDING ROLLER FOR CALENDERS

Dieter Junk, Kreuztal-Buschhutten; Jurgen Schlunke, Krefeld, and Heinz Boixen, Huls, all of Germany, assignors to Joh. Kleinewefers Sohne Maschinenfabrik, Krefeld, Germany

Filed Jan. 27, 1971, Ser. No. 110,100
Claims priority, application Germany, Aug. 25, 1970, P 20 42 001.3
Int. Cl. B21b *13/02*
U.S. Cl. 29—116 AD 3 Claims



A guiding roller for calenders, especially glazing calenders, which has a multi-sectional tubular guiding mantle surrounding a roller shaft the pivot ends of which are each supported by a bushing journalled in self-aligning bearing means. The said bearing means also support the respective adjacent end of the adjacent tubular mantle section, while control means are provided for selectively adjusting said pivot ends relative to said bushing and relative to the respective pertaining mantle section.

3,672,019

## METHOD OF ADJUSTING ROLLING BEARINGS

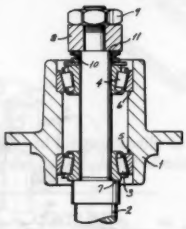
Thomas George Barnbrook, and Frederick James Wren, both of Northampton, England, assignors to The Timken Company, Canton, Ohio

Filed June 22, 1970, Ser. No. 48,286

Claims priority, application Great Britain, June 30, 1969, 33,018/69

Int. Cl. B23p *11/00*

U.S. Cl. 29—148.4 A 14 Claims



A bearing capable of carrying thrust loads is adjusted by positioning a spacer washer against one of the bearing races and applying an axial load to that washer. The load is resisted by the bearing and is sufficient in magnitude to deform the washer first elastically and then plastically. The plastic deformation is such that upon removal of the axial load and recovery of the elastic deformation, the spacer will provide the desired end play or preload adjustment for the bearing.

3,672,020

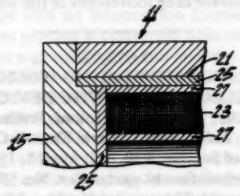
## METHOD OF MAKING A HEAT PIPE HAVING AN EASILY CONTAMINATED INTERNAL WETTING SURFACE

Robert Alfred Freggens, Lancaster, Pa., assignor to RCA Corporation

Filed May 18, 1970, Ser. No. 38,323

Int. Cl. B23p *15/26;* B21d *53/00*

U.S. Cl. 29—157.3 R 10 Claims



A novel method of making a heat pipe having an easily contaminated internal wetting surface, comprising cleaning the surface and then coating the cleaned surface with a material that is soluble in the working fluid at an operating temperature of the heat pipe. For a heat pipe employing a mercury metal working fluid, easily-oxidized ferrous metal surfaces of the capillary structure and envelope inner wall may be coated with nickel.

3,672,021

## METHOD OF MAKING WHEELS

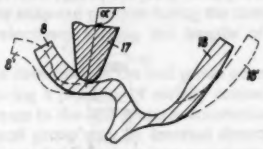
Friedrich Wilhelm Schulte; Manfred Diels, and Wilhelm Rosenkranz, all of Meinerzhagen, Germany, assignors to Otto Fuchs, Meinerzhagen, Germany

Filed Feb. 13, 1970, Ser. No. 11,233

Claims priority, application Germany, Feb. 20, 1969, P 16 08 465.2

Int. Cl. B21h *1/02;* B21k *1/32*

U.S. Cl. 29—159.01 11 Claims



Wheels, particularly for automotive vehicles, are made by first forming a disk-shaped blank, forging the same into a semi-finished wheel having a hub and a wheel disk surrounding the hub and having a peripheral rim provided with a cylindrical circumferential edge face, and then mounting the semi-finished wheel in a machine. The edge face is thereupon engaged with at least one pressure roller and split under application of pressure in direction inwardly of the edge face and towards the hub to obtain two unfinished flanges. The unfinished flanges are rollingly deformed in opposite directions axially of the hub and to the desired configuration to thereby obtain two finished wheel flanges.

3,672,022

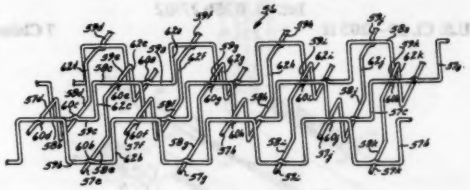
## WIRE CORE STRUCTURE FOR SANDWICH MATERIAL

Charles Herbert-Greer York, Costa Mesa, Calif., assignor to Wire Core Development Corp.

Filed April 1, 1969, Ser. No. 811,945

Int. Cl. B21c *37/00;* E04c *2/42*

U.S. Cl. 29—191.6 5 Claims



A wire core structure for sandwich material including a plurality of planar wire core ribbons which are formed of wire bent at right angles to form anchor sections on opposite sides of the core to engage the face sheets of the sandwich material—said core anchor sections being joined by joinder sections which extend at a right angle to the plane of the core structure. A notch is provided on the outside of some anchor sections to receive a cross wire extending in the plane of said core structure at a right angle to said core ribbons. Such notches are related to the diameter of said cross wires so that the cross wires will project slightly beyond the notch into which is received the cross wire, which spacing provides space for an adhesive, and yet, the cross wires may be deformed enough in welding to make the outer side of the cross wires generally flush with the outer sides of the anchor sections. In one embodiment there is a core ribbon which is serpentine and in one embodiment the ribbons are used in pairs which are offset to form a series of closed sections and a series of downwardly open sections and a series of upwardly open sections with a se-

ries of cross wires being received into said last mentioned downwardly open and upwardly open sections.

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**3,672,023**

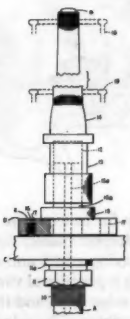
## ALIGNING DEVICE FOR SPINDLE ASSEMBLY

**Carl McCombs, 1 Lisa Drive, Greenville, S.C.**

**Filed Feb. 10, 1971, Ser. No. 114,161**

**Int. Cl. B23p *19/00***

**U.S. Cl. 29—200 P** **2 Claims**



A device for aligning a spindle on spinning and twisting frames which is carried on an intermediate body of the spindle assembly. The device includes an aligning member which extends radially from the spindle. A plurality of adjustable setscrews are carried in threaded holes in the aligning member with the bottom of the screws being in contact with the rail upon which the spindle assembly is carried. The holes are equally spaced around the spindle so that by rotating the screws the spindle can be aligned on a desired axis.

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**3,672,024**

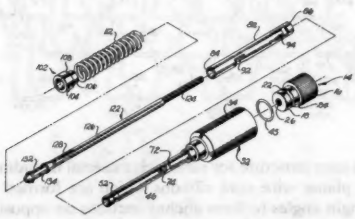
## CONNECTOR CLIP REMOVAL TOOL

**John E. Barr, Van Nuys, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed Oct. 30, 1970, Ser. No. 85,364**

**Int. Cl. B25b *27/02***

**U.S. Cl. 29—203 H** **7 Claims**



A contact clip extraction tool for use in connection with a contact clip that is releasably lockable in a bore within an electrical connector body. The tool comprises a capture rod having a clip retainer portion for insertion in said connector body bore, the clip retainer portion being slidable into the interior of said clip. The clip retainer portion is expandable when the clip retainer portion is inserted a predetermined distance into the clip. The clip retainer portion can engage the clip in a manner such that withdrawal of said clip retainer portion from the body also results in withdrawal of said clip therefrom. Further, a spring may be secured to the tool for retracting said clip retainer portion onto the clip when the clip retainer portion has been inserted the predetermined distance into the clip. Also a protective sleeve surrounding the rod and slidable with respect to the rod, the sleeve protects the connector body bore during insertion and extraction of the tool.

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**3,672,025**

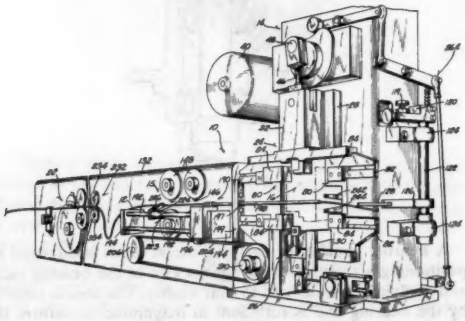
## TERMINAL APPLICATOR

**Ragnar Gudmestad, West Allis, Wis., assignor to Artos Engineering Company, New Berlin, Wis.**

**Filed Dec. 4, 1970, Ser. No. 95,284**

**Int. Cl. H01r *43/04***

**U.S. Cl. 29—203 D** **21 Claims**



An automatic terminal applying machine including a pair of terminal applicators, a wire cutting and stripping assembly located between and in line with the applicators, a wire measuring unit, a wire feed assembly including a wire guide assembly to accurately align the wire in the cutting and stripping assembly, and a wire drag and discharge assembly for holding the wire during terminal application and discharging the wire from the assembly after terminal application to a collection trough or wire stacking device. The cycle of operation of each of the assemblies is controlled by a number of cams secured to a common drive shaft and controlled by a one revolution pin clutch. A clutch controlled loop assembly provides a loop in the wire to minimize drag movement of the wire guide tube.

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**3,672,026**

## APPARATUS FOR DEVELOPING WOUND COILS FOR ELECTROMAGNETIC DEVICES

**Arthur S. Cutler, Elnora, N.Y., and Dallas F. Smith, Fort Wayne, Ind., assignors to General Electric Company**

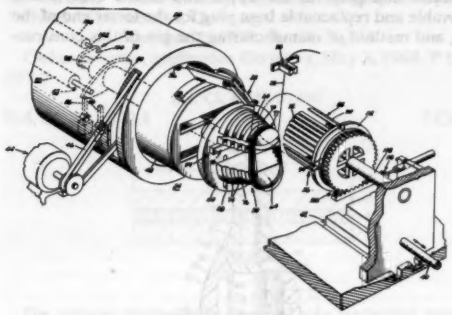
**Continuation of Ser. No. 839,742, April 2, 1969, abandoned, which is a continuation-in-part of Ser. No. 594,463, Nov. 15, 1966, abandoned. This application May 11, 1970, Ser. No. 36,245**

**Int. Cl. H02k *15/00***

**U.S. Cl. 29—205 R** **22 Claims**

Apparatus for developing electrical coil groups formed of a number of coils in a coil group-accommodating member for ultimate transfer into selected slots of a magnetic core. The coil group-accommodating member is supported adjacent a non-collapsible, longitudinally movable coil form in position to receive the coil group. The coils in each coil group are developed by winding turns of a given coil on the non-collapsible form and concurrently moving some of the turns from the

form into the accommodating member where the individual coil groups are finally developed. The non-collapsible coil



form is periodically moved longitudinally to produce coils of differing spans during the development of each coil group.

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**3,672,027**

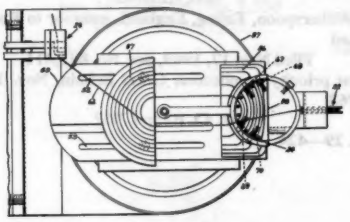
**COIL DEVELOPING APPARATUS**

**Richard B. Arnold, Fort Wayne, Ind., assignor to General Electric Company**

**Division of Ser. No. 884,145, Dec. 11, 1969, Pat. No. 3,579,791, which is a continuation-in-part of Ser. No. 748,406, July 29, 1968, abandoned. This application June 1, 1970, Ser. No. 42,150**

**Int. Cl. H02k *15/00***

**U.S. Cl. 29—205 R** **10 Claims**



Apparatus for developing one or more coil groups of electrically conductive wire. The apparatus includes a coil turn-forming assembly having a jump form portion and a snap-out form portion. The jump form portion includes a plurality of turn-gauging steps with an interruption formed at one side. The snap-out form portion is supported adjacent to the interruptions on the turn-gauging steps and includes a corresponding number of snap-out winding form plates, each having a fill-in winding section for spanning one of the associated interruptions on the jump form portion.

The apparatus also includes a flyer for placing wire on the coil turn-forming assembly to generate turns and a jump means for locating a turn-gauging step of the jump form portion in the path of the wire being wound by the flyer. Concurrently as the jump means locates a turn-gauging step in the path of the wire wound by the flyer, a snap-out plate is extended to place a fill-in winding section in alignment with its associated interruption of a turn-gauging step. The turn-gauging step of the jump form portion and its associated fill-in winding section cooperate to provide a form for winding or generating turns of a predetermined length for receipt in a coil group accommodating means or device. Preferably, the coil group accommodating means is comprised of spaced curved blades defining turn receiving slots. The spaced curved blades and corresponding fill-in winding sections of the snap-out plates have associated mating curved surfaces whereby, when a snap-out plate is engaged with a curved blade, the entry of the turns of a coil being generated into the corresponding turn receiving slot is facilitated by the mating curved surfaces. Thus each coil is developed directly in the coil group accommodating means as the turns for the coil are generated about the coil turn-forming assembly. Also, the jump form portion and the snap-out plates may be supported for movement in essentially a vertical direction, and the curved blades are supported in alignment with the snap-out plates so that force of gravity facilitates the removal of the turns from the coil form assembly.

Additionally at least part of the jump form portion is movable relative to the snap-out portion during the turn-generating operation for selectively varying the lengths of successive turns.

A coil group is developed in the coil group accommodating means by producing a plurality of serially connected wound coils of a coil group in the coil group accommodating means. Thereafter the coil group may be inserted directly from the coil group accommodating means into preselected slots of a stator core.

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**3,672,028**

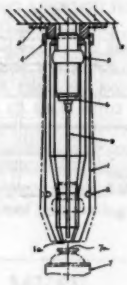
**DIP TUBE GUIDE ARRANGEMENT**

**Monte J. Boling, Fairfield, N.J., assignor to Anderson Machine Works, Ridgefield Park, N.J.**

**Continuation-in-part of Ser. No. 774,853, Nov. 12, 1968. This application June 12, 1970, Ser. No. 45,749**

**Int. Cl. B23p *19/04*; B21d *39/04***

**U.S. Cl. 29—208 B** **7 Claims**



A guide for association with a movable chuck in a machine for inserting valved dip tubes in aerosol containers, the guide comprising a plurality of fingers having ends which, in one position, define a restricted opening through which a dip tube can be freely advanced in a desired direction, and which can be moved by the advancing chuck to a second position through which the valve body can be passed for engagement with the open neck of the container.

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**3,672,029**

**FASTENER DRIVING APPARATUS**

**Albert T. Butriss, Westlake, Ohio, assignor to Eaton Yale & Towne Inc., Cleveland, Ohio**

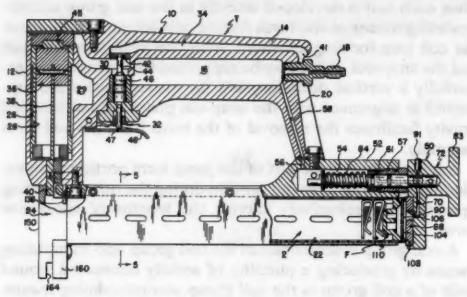
**Filed Sept. 30, 1970, Ser. No. 76,743**

**Int. Cl. B23p *11/00, 19/04*; B25d *9/16***

**U.S. Cl. 29—243.56** **5 Claims**

A fastener driving apparatus including an improved construction for a fluid operated fastener driving tool adapted to

receive a detachable and replaceable magazine for automatically and sequentially feeding a plurality of fasteners in an



aligned side-by-side relation into a predetermined uniform spaced and secured position on a work piece.

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**3,672,030**

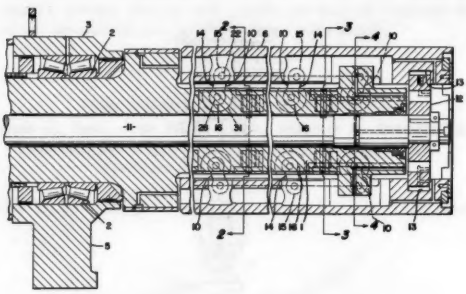
**DOWNCOILER MANDREL OF THE TOGGLE LINK TYPE FOR HOT STRIP MILLS, AND METHODS FOR REPAIRING OR REBUILDING SAME**

**Stanley Darwin Noll, Shaker Heights, and William F. Delfeld, Lyndhurst, both of Ohio, assignors to Production Experts, Inc., Cleveland, Ohio**

**Filed March 9, 1970, Ser. No. 17,828**

**Int. Cl. B22d *19/10*; B21d *53/10***

**U.S. Cl. 29—401** **6 Claims**



A method of repairing a downcoiler mandrel is described, in which worn areas of the mandrel body and segments are machined to dimensions suitable for accommodating bushings and half-bushings of pre-selected materials, the toggle links are machined in their pin areas to receive bushings of selected materials, and the outer arcuate surfaces of the links are plated with a hard wear-resistant metal, such as chromium. The overall construction resulting from such repairs and replacements is also applicable to the construction of new mandrels of this type.

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**3,672,031**

**METHOD OF MANUFACTURING PLASTIC BOWLING PIN**

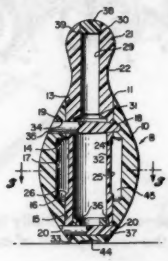
**Maurice Anthony Negrini, 25 Quimby Avenue, Woburn, Mass.**

**Division of Ser. Nos. 836,518, June 25, 1969, and Ser. No. 882,036, Dec. 4, 1969, Pat. No. 3,572,710. This application Sept. 17, 1970, Ser. No. 73,131**

**Int. Cl. B23p *17/00***

**U.S. Cl. 29—417** **4 Claims**

This specification discloses a bowling pin of plastic that has the appearance of a wooden pin, sounds like a wooden pin, and scores like a wooden pin. These properties are imparted by the structure comprising a hollow main body, a hollow core with a space between the core and the body, a removable and replacable cap plug for the upper end of the core, and a removable and replaceable base plug for the lower end of the core; and method of manufacturing the pin of this construction.



The present invention relates to blowling pins, and is concurred primarily with a bowling pin of plastic that has all the properties that are of vital interest to a bowler, of a wooden pin and which properties are imparted to the pin by the structural characteristics thereof.

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**3,672,032**

**PROCESS FOR MOUNTING A WORKPIECE FOR MACHINING**

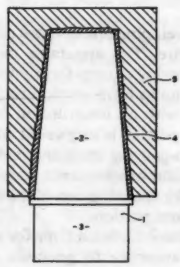
**Harry Witherspoon, Ealing, England, assignor to Rolls-Royce Limited**

**Filed Nov. 17, 1969, Ser. No. 882,411**

**Claims priority, application Great Britain, Nov. 15, 1968, 54,188/68**

**Int. Cl. B23p *17/02***

**U.S. Cl. 29—424** **7 Claims**

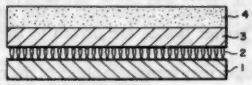


A process for producing a removable workpiece mounting for holding the workpiece during machining operations comprising the steps of applying a settable coating to a portion of the workpiece to provide a key, and casting a block of material around said coating when set, said cast material being solid at room temperature and said coating remaining stable at least up to the melting temperature of said cast material, said coating comprising a grit in a binder and said binder being soluble in a solvent which is non-corrosive to the workpiece material.

## 3,672,033
## METAL LAMINATED MATERIAL AND PROCESS FOR ITS MANUFACTURE

Ulf Richter, Wasserscheide, Germany, assignor to Dynamit Nobel AG, Troisdorf, Germany

Filed Jan. 8, 1970, Ser. No. 1,333
Claims priority, application Germany, May 3, 1969, P 19 22 757.7
Int. Cl. B23k *21/00*
U.S. Cl. 29—470.1 7 Claims

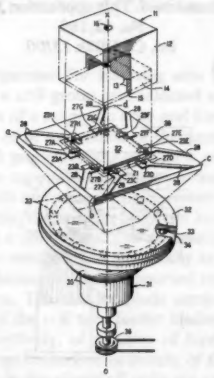



The present disclosure is directed to a laminated metallic composite and to a process for the production of said composites which comprises placing metallic spacers between the metal sheets to be bonded, said spacers being wound in a helical shape from a wire with the axis of the spirals oriented substantially parallel with respect to the metal sheets, applying a layer of explosive to the upper sheet of metal and detonating said explosive to produce impingement and welding of the upper sheet with the remaining sheets.

## 3,672,034
## METHOD FOR BONDING A BEAM-LEAD DEVICE TO A SUBSTRATE

James E. Clark, Coopersburg, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Division of Ser. No. 646,251, June 15, 1967. This application Jan. 14, 1970, Ser. No. 7,330
Int. Cl. B23k *31/02*
U.S. Cl. 29—471.1 22 Claims



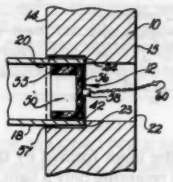
A process and an apparatus are disclosed for the thermocompression bonding of beam-lead integrated circuits to a series of conductor patterns located on a substrate.

The flat tip of a hollow rectangular rod comprises the heating unit. The beam-lead device is positioned on a substrate; the substrate is mounted on a carrier; and, illustratively, the carrier is located on a wobble table. When appropriate means undulate the wobble table, the beam leads are rocked into successive contact with the heating unit and thereby are bonded to the substrate.

## 3,672,035
## METHOD OF FABRICATING A TUBE SHEET ASSEMBLY

Irving Lieberman, Covina, Calif., assignor to Whittaker Corporation, Los Angeles, Calif.

Filed March 20, 1970, Ser. No. 21,435
Int. Cl. B23k *31/02*
U.S. Cl. 29—471.3 5 Claims




A tube sheet assembly has tube sheets with a plurality of orifices formed therein with an enlarged bore inner portion extending partially through the thickness of the sheet for slidably receiving the tube ends intersecting with a coaxial smaller outer bore portion extending through the rest of the sheet thickness corresponding to the inner diameter of the tube. With the ends of each tube positioned in the enlarged inner bore portion of the respective orifices, an explosive welding charge is inserted through the smaller outer bore portion to be positioned within the end of each tube. The charges may then be detonated simultaneously to weld the outer surfaces of the tube ends to the surrounding inner tube sheet surfaces within the enlarged bore portion of the orifices, thus providing an essentially uniform fluid flow path free of discontinuities from the tube sheet into the tubes.

## 3,672,036
## METHOD OF MAKING ASSEMBLIES OF STAINLESS STEEL TUBING

John P. Ziemianski, Avonmore, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Feb. 26, 1969, Ser. No. 802,671
Int. Cl. B23k *31/02*
U.S. Cl. 29—492 2 Claims

A method of making assemblies of stainless steel tubing or piping and conventional plumbing fittings which comprises coating stainless steel tubing, at least at the ends thereof, with copper, tin or alloys thereof and joining a fitting coated portion by soldering.

## 3,672,037
## NITRIDE STRENGTHENED STAINLESS STEEL COMPOSITE AND PRODUCTION THEREOF

Lynn E. Kindlimann, Natrona Heights, and Alexander B. Greene, New Kensington, both of Pa., assignors to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Feb. 28, 1969, Ser. No. 803,442
Int. Cl. B23k *31/02*
U.S. Cl. 29—497.5 9 Claims

The application describes composite members containing a plurality of layers at least one of which is nitride strengthened stainless steel and a pressure bonding method for producing them.

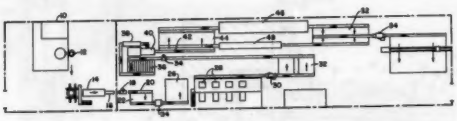
## 3,672,038
## METHOD AND APPARATUS FOR PRODUCING EXTRUDED STEEL SHAPES

Daniel L. Lombard, Youngstown, Ohio, assignor to Lombard Corporation, Youngstown, Ohio

Filed May 5, 1970, Ser. No. 34,838
Int. Cl. B23k *19/00*
U.S. Cl. 29—527.6 5 Claims

A method and apparatus for producing extruded steel shapes, characterized in that no rolling or forging of a billet is

required prior to the time that the billet is placed in an extrusion press container. The entire system consists only of a refining furnace, a continuous casting machine for casting a bar which is cut into desired lengths, a consumable electrode furnace which uses the bars from the casting machine as electrodes to be melted, and the extrusion press itself which ex-



trudes sections of the ingot formed by the consumable electrode furnace while requiring only a light surface treatment of the billets prior to extrusion. In this manner, the capital investment in a mill for producing bars of various shapes is reduced considerably.

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**3,672,039**

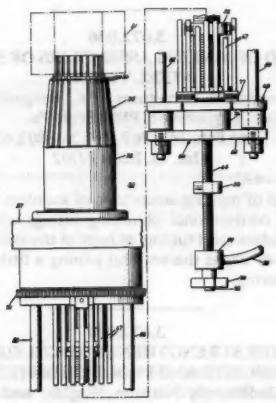
## METHOD FOR INSERTING INSULATORS AND COIL TURNS INTO THE SLOTS OF A MAGNETIC CORE

**Richard B. Arnold, Fort Wayne, Ind., assignor to General Electric Company**

**Division of Ser. No. 875,895, Nov. 12, 1969, which is a continuation-in-part of Ser. No. 748,405, July 29, 1968, abandoned. This application May 6, 1970, Ser. No. 35,175**

**Int. Cl. H02k** *15/00*

**U.S. Cl. 29—596** **11 Claims**



Method for concurrently inserting insulators and side turn portions of an electrical coil into selected axially extended slots of a magnetic core. For inserting the insulators into the slots, insulator pushers are slidably disposed in guide apertures of the apparatus. The side turn portions of the electrical coil are inserted into the axially extending slots by a preselected number of coil turn feeder blades movably supported relative to a divider blade section. The divider blade section and coil turn feeder blades define a series of turn-receiving gaps in which the electrical coil is carried.

A driver actuated by a suitable power source effects a movement of the insulator purshers in an axial direction continuously through a first, second and a third increment of travel to effect placement of the insulators in the slots. The divider blade section and the coil turn feeder blades are conjointly actuated in an axial direction during the second increment of travel. Upon completion of the second increment of travel the divider blade section and coil turn feeder blades are extracted and extend through the bore of the magnetic core. During the third increment of travel of the driver, only the insulator pushers and the coil turn feeder blades are actuated in an axial direction, and upon completion of the third increment of travel the side turn portions of the electrical coil are inserted into predetermined pairs of slots. Movement of the coil turn feeder blades relative to the divider blade section materially reduces the frictional drag on the coils during insertion. Preferably, the coil turn feeder blades are formed with reduced portions terminating in a pair of turn-pushing ledges, and the turn-receiving gaps are defined by the walls of the reduced portions and adjacent walls of the divider blade section. Also, the travel of the driver through the third increment of its travel is resiliently cushioned as the insulator pushers and coil turn feeder blades are driven to the fully extended position.

Also, the ledges may terminate short of the peripheral edges of the feeder blades, and the feeder blades include shoulders axially recessed from the ledges. With this arrangement the gaps form extensions of the slot entrances to receive some of the side turn portions as other side turn portions are inserted into predetermined slots. The shoulders thereafter effect insertion of the side turn portions first received in the slot entrance extensions.

The method can be beneficially practiced to insert side turn portions of an electrical coil group even when insulators are not being inserted.

With this arrangement it is possible to accommodate magnetic cores of different stack heights with relatively minor adjustments and to insert mechanically loaded insulators into magnetic cores having relatively small diameter bores. The coil turn feeder blades and divider blade section form a rigid structure for precisely controlling the insertion of the coil side turn portions thereby minimizing a possibility of damage to the conductor wire during the insertion process.

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**3,672,040**

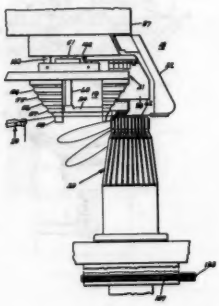
## METHOD OF DEVELOPING COILS OF A COIL GROUP FOR A MAGNETIC CORE

**Richard B. Arnold, Fort Wayne, Ind., assignor to General Electric Company**

**Division of Ser. No. 884,145, Dec. 11, 1969, Pat. No. 3,579,791, which is a continuation-in-part of Ser. No. 748,406, July 29, 1968, abandoned. This application June 1, 1970, Ser. No. 42,189**

**Int. Cl. H02k** *15/00*

**U.S. Cl. 29—596** **15 Claims**



A method of developing one or more coil groups of electrically conductive wire in a coil group accommodating device such as coil insertion tooling. A coil turn-forming assembly is positioned with a snap-out winding form plate in alignment with a corresponding turn-gauging step and engaging a coil group accommodating device adjacent a turn receiving slot. Turns of wire are generated about the winding form plate and turn-gauging step and received in the turn receiving slot during the generation operation. Thereafter, other snap-out winding form plates are sequentially positioned in alignment with a

corresponding turn-gauging step and engaging the coil group accommodating device adjacent corresponding turn receiving slots. The turn generating operation is repeated using each winding form plate and turn-gauging step, with the generated turns being received in the corresponding turn receiving slot during that generation operation.

When all the coils for one coil group have been developed in the coil group accommodating device, the coil group accommodating device can be rotated to bring other turn receiving slots in alignment with the coil turn-forming assembly. Then the desired number of operations, as described above, can be repeated to develop, in the coil group accommodating device, additional coil groups. When the coil group accommodating device is coil injection tooling, the developed coils can thereafter be inserted from the coil injection tooling into preselected slots of a magnetic core.

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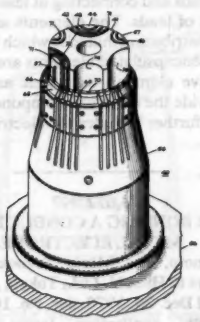
**3,672,041**

**METHOD AND APPARATUS FOR INSERTING COIL TURNS INTO THE SLOTS OF A MAGNETIC CORE**

**Richard B. Arnold, Fort Wayne, Ind., assignor to General Electric Company**

**Filed Dec. 21, 1970, Ser. No. 100,219**
**Int. Cl. H02k *15/00***
**U.S. Cl. 29—596** **9 Claims**



Method and apparatus for inserting side turn portions of electrical coils in a coil group into selected axially extending coil receiving slots of a magnetic core and for freely shedding end turn portions of at least some of the turns within at least two coils of a coil group radially toward a generally solid or yoke section of the core as the side turn portions of other turns in the selected coils are moved axially toward an end face of the core. Preferably, the at least two coils include two of the innermost coils in a coil group. The side turn portions of the electrical coils are inserted into the axially extending slots by coil turn feeder blades movably supported relative to the divider blade section. The divider blade section and the turn pushing surfaces of the coil turn feeder blades define the side and bottom, respectively, of a series of turn-receiving gaps which have openings in the free extremity of the divider blade section and in which the electrical coils are carried. Insulator pushers may also be provided for inserting insulators into slots after side turn portions of coils have been placed therein.

An actuating assembly includes a driver actuated by a suitable power source and effects continuous axial movement of insulator pushers through first, second and third increments of travel to effect placement of insulators in the slots. The divider blade section and the coil turn feeder blades are conjointly actuated in an axial direction during the second increment of travel. Upon completion of the second increment of travel the divider blade section extends axially through the bore of the magnetic core. At this time, the free extremity of the divider blade section in the vicinity of at least two turn-receiving gaps in which the two innermost coils are carried is spaced closely adjacent to the end face of the core. Preferably, the end face of the core and the divider section surface are within one eighth to one quarter inch of each other. During the third increment of travel, the insulator pushers and the coil turn feeder blades are moved in an axial direction relative to the core and divider blade section. During this increment of travel, as the end turn portions of the two innermost coils in one or more selected coil groups move to the gap openings in the free extremity of the divider blade section, the end turn portions move away from the gap openings and toward the yoke section of the core. The method and apparatus can be used even when insulators are not being inserted.

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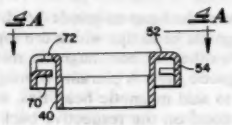
**3,672,042**

**METHOD OF MAKING POLE MEMBERS**

**Ralph L. Jaeschke, Kenosha, Wis., assignor to Eaton Corporation, Cleveland, Ohio**

**Filed April 26, 1971, Ser. No. 137,378**
**Int. Cl. H01f *7/06***
**U.S. Cl. 29—602** **14 Claims**




The method of manufacturing pole members or rotors such as the type used in electromagnetic friction clutches and brakes. The pole member is manufactured from a stamped blank which is drawn into a suitable form. A plurality of support fingers are then formed and non-magnetically joined to form a hub. A portion of the hub is then removed forming an annular cavity in which an annular ring of friction material is installed. The hub may then be splined or keyed for mounting in the clutch or brake.

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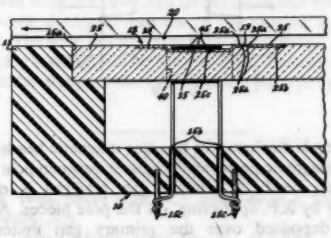
**3,672,043**

**MINIATURE MAGNETIC HEAD**

**Cebern B. Trimble, Hawthorne, Calif., and Robert R. Skutt, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio**

**Division of Ser. No. 511,843, Dec. 6, 1965, Pat. No. 3,564,521. This application April 29, 1970, Ser. No. 43,631**
**Int. Cl. H01f *7/06***
**U.S. Cl. 29—603** **11 Claims**



This invention relates generally to magnetic transducer devices, and more particularly to a novel magnetic transducer construction and method of making.

3,672,044

## MULTI-CHANNEL DUAL-GAP MAGNETIC HEAD

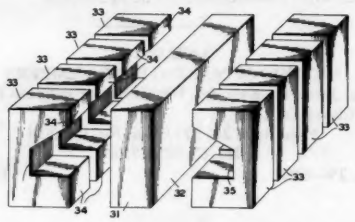
Takashi Tanaka, Osaka, and Yasuo Nomura, Nishinomiya, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed March 4, 1970, Ser. No. 16,320

Claims priority, application Japan, March 10, 1969, 44/19680

Int. Cl. G11b 5/42; H01f 7/06

U.S. Cl. 29—603 1 Claim




A multi-channel dual-gap magnetic head. The head has a plurality of magnetic head tips which are separated magnetically from each other by non-magnetic materials and each having two magnetic gaps. A plurality of magnetic back cores are connected to said magnetic head tips, and a plurality of windings are wound on the respective back cores. The corresponding magnetic gaps in the head tips are aligned in two straight lines which are parallel to each other and perpendicular to the direction of tape movement of the tape for a recording and reproducing device. The magnetic gaps aligned in one straight line have at least two different gap widths.

The method of making the multi-channel dual-gap head is to provide a magnetic plate and join to it a plurality of grooved magnetic material blocks by means of spacers of various thicknesses. Thereafter, slots are cut at the joints between the blocks, and non-magnetic plates are inserted in the slots. The resulting assembly is trimmed appropriately and back cores are attached and connected to the head tips.

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3,672,045

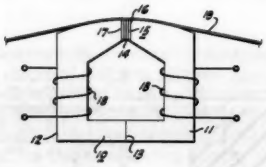
## PROCESS FOR BONDING MAGNETIC HEADS

David D. Robertson, Palo Alto, Calif., assignor to Surface Technology, Inc., Mountain View, Calif.

Filed April 29, 1970, Ser. No. 33,013

Int. Cl. G11b 5/42

U.S. Cl. 29—603 10 Claims




A process is disclosed for bonding magnetic heads by forming a low magnetic permeability spacer between pole pieces of a magnetic head. A primary gap material is deposited, preferably by R.F. sputtering, on the pole pieces. A bonding layer is deposited over the primary gap material, also preferably by R.F. sputtering. The thus coated pole pieces are vacuum degassed and heated to a temperature in the range of 150° to 450° C. The bonding layers are then mated and a pressure of from 50 to 100 psi is applied and held between ½ and 4 hours. Any material which has a relatively low magnetic permeability and can be applied by R.F. sputtering or thermal evaporation is suitable for the primary gap material. The bonding layer is formed of either copper, silver, gold or titanium, or any material which produces a good diffusion bond under the above conditions.

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3,672,046

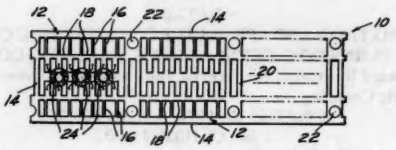
## METHOD OF MAKING AN ELECTRICAL COMPONENT

William T. Storey, II, West Chester; Robert F. Procter, Bristol; Charles H. A. Snyder, Philadelphia; George M. Jacob, Flourtown, and Raymond T. Mooney, Philadelphia, all of Pa., assignors to Technitrol, Inc., Philadelphia, Pa.

Filed Jan. 14, 1970, Ser. No. 2,742

Int. Cl. H01b 13/00; H05k 3/00

U.S. Cl. 29—624 12 Claims




The method comprises forming a lead frame having a plurality of sets of leads and connecting at least one electrical element to each set of leads. The elements are preencapsulated with a pressure-distributing material which is substantially free of gases. The preencapsulated elements are then encapsulated and the respective elements and their associated leads are separated to provide the electrical components.

The invention further includes the electrical component per se.

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3,672,047

## METHOD FOR BONDING A CONDUCTIVE WIRE TO A METAL ELECTRODE

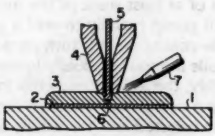
Yuzaburo Sakamoto, and Morio Toyooka, both of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 29, 1970, Ser. No. 102,309

Claims priority, application Japan, Dec. 29, 1969, 44/105284

Int. Cl. H01r 43/00; H05k 43/00

U.S. Cl. 29—628 9 Claims




A connector wire is bonded to a solder electrode by pressing the end portion thereof to the solder electrode by using a capillary while the capillary is heated up to a temperature not less than the melting point of the solder, by melting the solder electrode and then by cooling the whole bonding area of the connector wire and the solder electrode, thereby the end portion of the connector wire is buried in the solder electrode and is firmly fixed thereto.

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3,672,048

## STEAM POWERED VEHICLE

Phillip J. Conwell, RR #1, P.O. Box 35, Mt. Orab, Ohio

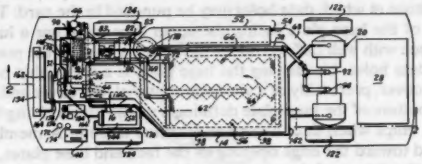
Filed May 25, 1970, Ser. No. 39,966

Int. Cl. B60k 3/00

U.S. Cl. 180—67 6 Claims

A passenger automobile or the like is steam power driven by providing a flat planar boiler beneath the passenger compart-

ment and intermediate of the main drive steam turbine and the combustion chamber which, depending upon whether the



vehicle is front wheel driven or rear wheel driven, may be located alternatively at the front or rear of the vehicle.

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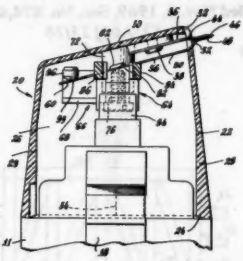
**3,672,049**

**HAIR TRIMMER ATTACHMENT FOR ELECTRIC SHAVERS**

**Michael Demci, Bridgeport, and Richard Ihasz, Stratford, both of Conn., assignors to Sperry Rand Corporation, New York, N.Y.**

**Filed Oct. 22, 1970, Ser. No. 82,882**
**Int. Cl. B26b** *19/38*
**U.S. Cl. 30—90** **6 Claims**



An auxiliary long-hair trimmer cutter head attachment for an electric shaver, the attachment including a fixed cutter, a movable cutter and a cutter drive member for supporting the movable cutter and maintaining the latter in cutting engagement with the fixed cutter.

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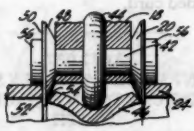
**3,672,050**

**TUBE CUTTER**

**Francis J. Hanback, Palos Verdes, Calif., assignor to McDonnell Douglas Corporation**

**Filed Aug. 5, 1970, Ser. No. 61,197**
**Int. Cl. B23d** *21/08*
**U.S. Cl. 30—99** **5 Claims**



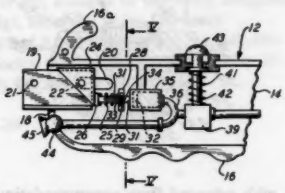
A tube cutting tool for the repair of permanently installed piping systems wherein a section of faulty tubing may be removed and a splicing sleeve fitted thereover for permanent repair in the piping system. The tool may be used in confined quarters since it does not rotate around the tubing. The cut is free of chips, burrs, or other minute particles that require purging of the line before use.

**3,672,051**

**AIR-OPERATED CUTTING DEVICE**

**Gerald S. Ramiccio, 24 Valley Road, West Milford, N.J.**

**Filed May 21, 1970, Ser. No. 39,359**
**Int. Cl. B26b** *1/08*
**U.S. Cl. 30—123 R** **8 Claims**



A tool for cutting off a part of a sheet of material from a receiving roller and tucking the cut edge portion around said roller, so that it continues to wind thereon comprising a housing, a knife mounted for sliding in and out of an end of said housing, a spring for biasing said knife so that it tends to return to a protected position in said housing, a piston with a rod connected to said knife, and a connection from a source of compressed air to said piston, said connection branching beneath said knife, so that when air is released to move the knife so that it protrudes from said housing, air is simultaneously released to act on the cut edge portion of said sheet of material.

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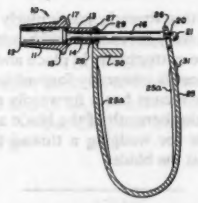
**3,672,052**

**INFANT FEEDING DEVICE**

**Allen C. Mason, P.O. Box 927, Golden, British Columbia, Canada**

**Filed Dec. 7, 1970, Ser. No. 95,745**
**Int. Cl. A47j** *43/28*
**U.S. Cl. 30—130** **3 Claims**



A device to simplify feeding infants their first solid foods which consists of a tube having an open end adapted to be inserted into the infant's mouth and a plunger movable within the tube to draw food into the tube by suction as the plunger is moved away from the open end and to expel that food into the child's mouth during movement of the plunger towards the open end. The tube has an external annular flange to prevent it from being inserted too far into the child's mouth and a stop to prevent the plunger from being pushed past the open end of the tube.

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**3,672,053**

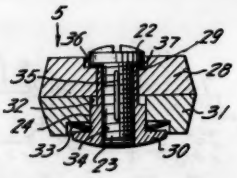
**PIVOT ARRANGEMENT**

**Richard R. Wiss, Short Hills, N.J., assignor to J. Wiss & Sons Co., Newark, N.J.**

**Filed Feb. 26, 1971, Ser. No. 119,096**
**Int. Cl. B26b** *13/00*
**U.S. Cl. 30—267** **12 Claims**

Improved pivot arrangement in scissors, shears snips and the like tools, the tool having an internally threaded pivot bushing or tubular shaft located at the pivot point of the blades, the bushing having an enlarged head at one end and a

reduced forward portion provided with two oppositely disposed flat sides. A metal spring-type washer coated with a material having a low friction coefficient is disposed between one of the blades, through which the bushing projects, and the enlarged head of the bushing. The other blade is provided with




an opening with opposed flats accommodating the reduced portion of the bushing. A locking screw having an enlarged head engages the internal threads of the bushing for adjusting the tightness between the blades; there being provided an antifriction washer between the locking screw head and the said other blade.

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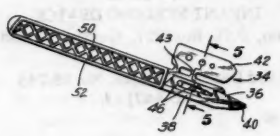
**3,672,054**

**CUTTER AND LIKE ARTICLE**

**Jack W. Kaufman, 357 Frankel Boulevard, Merrick, Long Island, N.Y.**

**Filed Nov. 13, 1969, Ser. No. 876,325**
**Int. Cl. B26b *29/02***
**U.S. Cl. 30—294** **8 Claims**




A cutter for cutting threads, particularly sutures, having a main body portion with jaw means and a cutter blade. The jaw means retaining the cutter blade in place and comprising fixed and hingeable elements integrally formed together. The fixed element of the jaw means has a forwardly extending pointed portion which resides beneath of the blade and forms a gap or slot with the blade for wedging a thread therebetween and cutting same against the blade.

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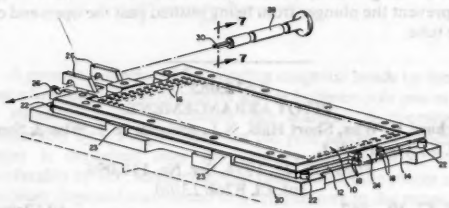
**3,672,055**

**HAND PUNCHING DEVICE FOR DATA CARDS**

**Eugene C. Krueger, Drexel Hill, Pa., assignor to Krueger Associates, Drexel Hill, Pa.**

**Filed Oct. 16, 1970, Ser. No. 81,421**
**Int. Cl. B26f *1/32***
**U.S. Cl. 30—358** **8 Claims**



A convenient, light weight, inexpensive, portable device for hand punching data cards comprising a transparent upper face plate and a mating base plate having a card size recess therebetween with an edge opening for the introduction of a data card therein, and both having holes of the preselected data hole size and shape in each of the numerous preselected positions at which data holes may be punched in the card. The side of the base plate facing the upper face plate has a hard surface with well defined edges surrounding each of the possible data holes. Underlying the base plate is a removable bottom cover, preferably of a yieldable material, the cover and/or the bottom of the base plate defining a recess for receiving the card chips when data holes are punched therein. A member urged toward the edge opening of the face and base plates, to lock the data card therein, preferably comprises a flexible extension of the yieldable bottom cover locked into position by locking members extending from said base and upper plates in the area of the edge opening. A hand held punch with a hard forward surface having a cross sectional shape corresponding to the size and shape of the data holes is provided to punch data holes at any of the preselected positions and a data card inserted in the card recess by forcing the punch through the corresponding holes in the upper face plate and base plate and the card which is inserted therebetween.

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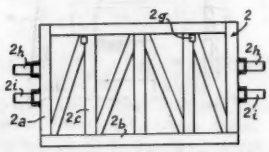
**3,672,056**

**INSTALLATION FOR PRODUCTION OF SOFT AND WASHED-CURD CHEESES**

**Jean-Pierre Barbier, and Jean-Pierre Feugnet, both of Retiers, France, assignors to Laiteries E. Bridel, Retiers, France**

**Filed Nov. 6, 1969, Ser. No. 874,488**
**Int. Cl. A01J *25/16***
**U.S. Cl. 31—49** **5 Claims**




Installation for production of soft and washed-curd cheeses, including a device for molding washed-curd, consisting of giant molds, each having the section of the final cheese product and capacity corresponding to a multiple of the final cheese volume, said molds being grouped in units; a drainer device including means for turning over the mold units by imparting to them a tilting motion, followed by a pendular one, to drive out the serum; and a device for cutting the molded curd taken out of the mold into slices to the final dimensions of the cheeses, including a cutting device equipped with means to adjust knife spacing in function of the length of the molded curd in order to obtain equal curd parts regardless of the length of molded curd.

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**3,672,057**

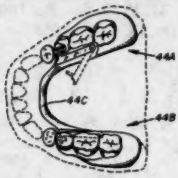
**ATTACHMENT FOR REMOVABLY SUPPORTING A PARTIAL DENTURE TO AN ADJACENT NATURAL TOOTH**

**Ralph C. Mays, 1139 North Gary Avenue, Tulsa, Okla.**

**Filed Nov. 13, 1970, Ser. No. 89,238**
**Int. Cl. A61c *13/22***
**U.S. Cl. 32—5** **10 Claims**

An attachment for removably supporting a partial denture to an adjacent natural tooth including a gudgeon member affixed to a natural tooth including a flat portion having a pinhole therein, a locking bar having at the first end a perpendicular extending pin portion of a diameter to be received in

the gudgeon member pinhole and at the other end a hinge pin opening, a hinge pin pivotally received in the locking bar




hinge pin opening, the hinge pin being adaptable to be affixed within a partial denture.

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**3,672,058**
**DENTAL IMPLANT**
**Albert-Jean Nikoghossian, 333n Chemin de la Madrague-Ville, 13 Marseille, 15, France**
**Filed April 16, 1970, Ser. No. 29,072**
**Claims priority, application France, April 18, 1969, 6911366; Feb. 6, 1970, 7004374**
**Int. Cl. A61c *13/22***
**U.S. Cl. 32—10 A** **5 Claims**

Endo-osseous dental implant composed, in a single piece, of a stump intended to support a dental prosthesis and a self-drilling conical screw extended by a long sharp point and process of putting such an implant in position by screwing in the walls of the alveolar recess of a freshly extracted tooth root after it has been filled with autopolymerizable resin.

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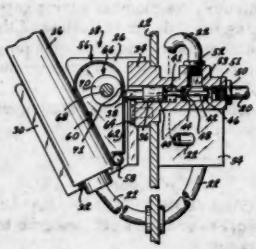
**3,672,059**
**HOLDER FOR DENTAL HANDPIECE**
**Dwight Allan Booth, Portland, Oreg., assignor to Omark Air Controls, Inc., Portland, Oreg.**
**Filed Feb. 16, 1970, Ser. No. 11,532**
**Int. Cl. A61c *19/02***
**U.S. Cl. 32—22** **3 Claims**



A stationary holder has a spring that is depressed by a dental handpiece placed in the holder to shut off the air supply to the handpiece. A manual shut off depressed the spring to shut off the air supply as desired with the handpiece removed from the holder.

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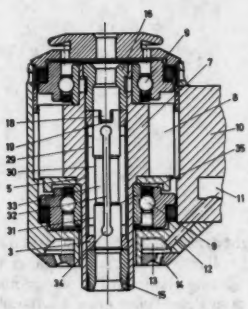
**3,672,060**
**DENTAL INSTRUMENT**
**Eugen Eibofner, Wennedach; Willi Fink, and Gerhard Farian, both of Biberach, Riss, all of Germany, assignors to Kaltenbach & Voigt, Biberach, Riss, Germany**
**Filed July 17, 1969, Ser. No. 842,493**
**Claims priority, application Germany, May 30, 1969, P 17 66 823.4; July 24, 1968, P 19 27 743.1**
**Int. Cl. A61c *1/08***
**U.S. Cl. 32—26** **8 Claims**



The invention relates to dental instruments of the type having a tool-receiving hollow shank. A tool clamping sleeve is provided in the shank, the sleeve being radially expansible in at least one area thereof on insertion of a tool shank therein. Annular spaces are provided between the sleeve and the shank and, in some instances, between the sleeve and the tool shank, to permit such expansion with effective clamping action.

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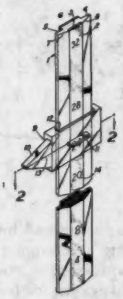
**3,672,061**
**DEVICE FOR MEASURING THE AMOUNT OF FLUID IN BOTTLES**
**Frank A. Alessi, 1558 Boulevard, Lorraine SW, Atlanta, Ga.**
**Filed March 25, 1970, Ser. No. 24,466**
**Int. Cl. G01b *5/00***
**U.S. Cl. 33—169 R** **3 Claims**



This invention relates to a device for measuring the amount of fluid remaining in a transparent container, such as a bottle by positioning a scribed line on a slidable pointer in alignment with the fluid level in the container. The quantity of fluid remaining is read directly on a scale. A separate scale is calibrated for each differently shaped container in terms of the liquid units desired to be measured, such as 1¼ ounce 'jig-

gers.' The scale is printed on a standard size insert which is mounted on a recess on the body of the device. The measuring device may be affixed directly to the container by means of a double-sided tape. Alternately, the device may be affixed to any vertical surface, and the container to be measured placed in a measuring relationship with the device.

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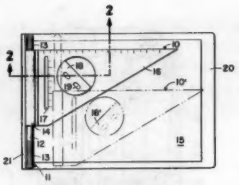
**3,672,062**

**PORTABLE DRAFTING DEVICE**

**Allister L. Baker, Denville, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.**

**Filed March 9, 1971, Ser. No. 122,406**
**Int. Cl. B43l *13/02***
**U.S. Cl. 33—109** **7 Claims**



A lightweight drafting device comprises a ferrous board and a magnetized roller which acts as a paper holder and guide means for a drafting element. The strong magnetic attraction between the board and roller ensure a fixed relation between the paper and drafting element, and maintains parallelism between drawn lines. The device is readily transportable and is operable in any convenient attitude.

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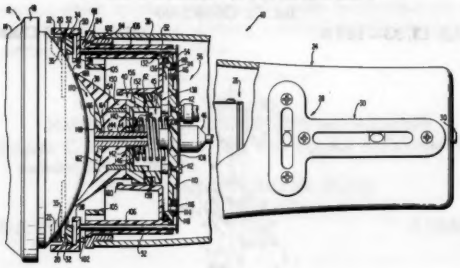
**3,672,063**

**HEADLAMP AIMING DEVICE WITH ORIENTATION SENSING**

**Evan Lloyd Hopkins, 1701 West 13th Street; Ross Eugene Hopkins, 1910 Darlene Way, and Evan Leon Hopkins, 1135 Oxford Drive, all of Emporia, Kans.**

**Filed Jan. 25, 1971, Ser. No. 109,149**
**Int. Cl. G01b *13/00*; G01c *9/00***
**U.S. Cl. 33—180 L** **20 Claims**



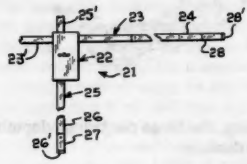
An elongate headlamp aiming tool including a seating surface for matingly abutting a reference surface of a vehicle headlamp with the tool positioned in a predetermined orientation. The tool may be held against the headlamp with a suction force of a magnitude capable of releasably and securely retaining the tool in that orientation. In instances of improper tool orientation, a sensing assembly cooperates with the headlamp and prevents the suction force from reaching that magnitude. A lower suction level thus produced signals the operator of the improper orientation by reason of the weight of the tool, and the operator may slide the partially supported tool across the headlamp until the correct orientation os obtained. Tool removal may be accomplished by positive fluid pressure.

**3,672,064**

**INDEXING MEANS FOR WALL PANEL OPENINGS**

**Johnny C. Elkins, P.O. Box 387, Robert Lee, Tex., and Gilbert A. Theriot, P.O. Box 4030, San Angelo, Tex.**

**Filed Dec. 21, 1970, Ser. No. 100,080**
**Int. Cl. G01b *3/38***
**U.S. Cl. 33—180 R** **9 Claims**



Indexing apparatus for accurately marking and positioning indicia to enable cutouts to be formed in a panel in order to accommodate fixtures and other objects associated with a building structure which must be received within the cutouts when the panel is attached to the structure.

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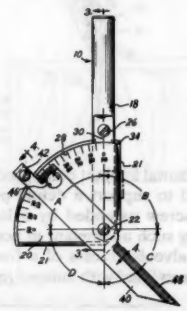
**3,672,065**

**ANGLE GAGE MECHANISM**

**Raymond G. Voss, 2120 West Pleasant Street, Davenport, Iowa**

**Filed Nov. 9, 1970, Ser. No. 88,017**
**Int. Cl. B27g *23/00***
**U.S. Cl. 33—185 R** **9 Claims**



An angle mechanism for use in setting up workpieces in a machine tool at any given angle in relation to the machine tool spindle or chuck centerline so that surfaces of the workpiece may be machined in the desired relationship to the given angle. The angle gage mechanism includes a shank assembly suitable for mounting in the machine tool spindle or chuck and a protractor-like member pivotally mounted on the shank assembly, the protractor-like member having gage edges that lie in a plane passing through the centerline of the shank assembly. The shank assembly includes clamping means to clamp the protractor-like member at a predetermined angle to the centerline of the shank assembly. The angle gate mechanism may include a reverse angle attachment to permit use of the mechanism through 360°.

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**3,672,066**

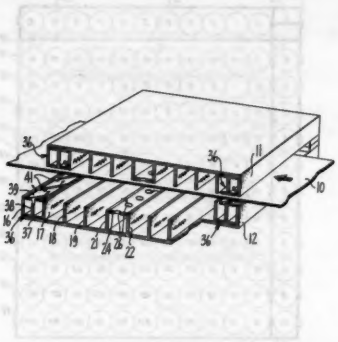
**MICROWAVE DRYING APPARATUS**

**Erik W. Stephansen, Foster City, Calif., assignor to Bechtel International Corporation**

**Filed Oct. 30, 1970, Ser. No. 85,568**
**Int. Cl. B01k *5/00***
**U.S. Cl. 34—1** **6 Claims**

A device is provided for drying a continuous web or sheet of material passing through a drying zone. The device includes

two air cushions which face each other and force the sheet of material passing through the drying zone to stay midway between opposite microwave drying units. Further, to prevent



wrinkling of the sheet material, the air cushions are provided by spaced slots extending at an angle to the path of travel of the sheet to ensure that streaking of a coating on the sheet is obviated.

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**3,672,067**

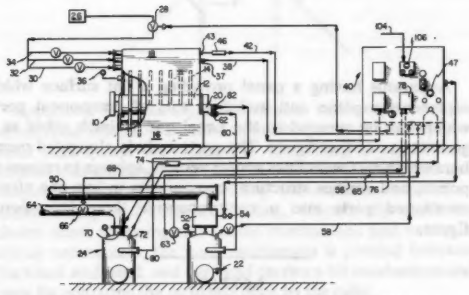
**METHOD FOR STEAM DRYING FILTER CAKE**

**Robert C. Emmett, Jr., Route 1, P.O. Box 216, East Dundee, Ill., and Donald A. Dahlstrom, 5340 Cottonwood Lane, Salt Lake City, Utah, assignors to Envirotech Corporation**

**Filed Oct. 30, 1970, Ser. No. 85,488**

**Int. Cl. F26b *5/04***

**U.S. Cl. 34—15** **5 Claims**



A method is disclosed for steam drying filter cake on a drum or disc type vacuum filter having a steam drying cycle wherein optimum cake thickness and moisture content is obtained at optimum thermal efficiency by controlling steam condensation within the cake at constant steam input, through control of the vacuum on the filter during cake formation and during filter cake drying with generally constant speed of rotation of the filter element.

**3,672,068**

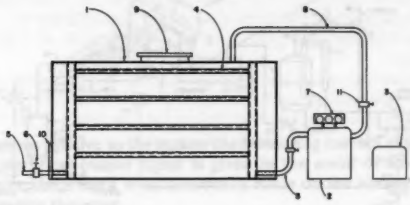
**METHOD AND APPARATUS FOR DRYING MATERIALS**

**Albert Challen Wilkison, c/o Lennox Associates & Co. Room 5, 1161 Melville Street, Vancouver 5, B.C., Canada**

**Filed Dec. 31, 1969, Ser. No. 889,595**

**Int. Cl. F26b *3/04***

**U.S. Cl. 34—15** **2 Claims**



An improvement in the method and apparatus used in vacuum drying materials such as grain, cotton, pulps, papers and peats in chambers, wherein the internal pressures are below atmospheric pressure. The previous methods and apparatus are simplified with respect to heating by distributing the heat generated by the operating vacuum pump throughout a heat exchanger manifold located inside the chamber.

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**3,672,069**

**FLUIDIZED-BED COOLER AND METHOD OF COOLING PARTICULATE SOLID MATERIAL**

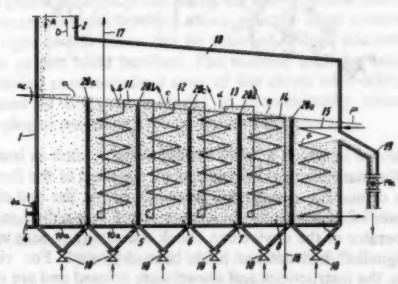
**Lothar Reh, Bergen Enkheim; Werner Hans Schmidt, Frankfurt, and Karlheinz Rosenthal, Neu-Isenburg, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany**

**Filed Feb. 20, 1970, Ser. No. 13,130**

**Claims priority, application Germany, Feb. 22, 1969, P 19 09 039.2**

**Int. Cl. F26b *7/00, 17/00***

**U.S. Cl. 34—20** **8 Claims**

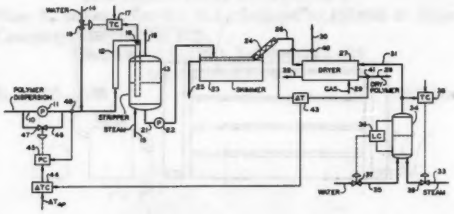


A fluidized-bed heat exchanger in which a plurality of compartments are arranged side by side and are separated by respective baffles forming weirs or overflow arrangements whereby particle transfer is from one compartment to another and each compartment is fluidized by the introduction of carrier or fluidizing gases from below. Within the individual compartments, heat exchangers are provided and are connected to conduct a cooling fluid from compartment to compartment countercurrent to the direction of movement of the particles. The cooling means or heat exchangers may be tube coils connected in series.

## 3,672,070
## DRYER CONTROL

Galen D. Stacy, and Raymond G. Rohlfing, both of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Sept. 1, 1970, Ser. No. 68,642
Int. Cl. F26b 3/00
U.S. Cl. 34—25 4 Claims



Particulate material, such as an olefin polymer, is passed through a heated dryer where it is contacted with a stream of gas. The flow of material to the dryer is controlled in response to a measurement of the temperature differential between the material removed from the dryer and the gas removed from the dryer.

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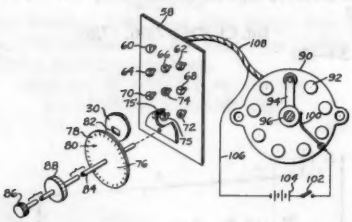
## 3,672,071
## GAME DEVICE

Victor J. Prola, 334 Maple Avenue, Blairsville, Pa.

Filed Feb. 24, 1970, Ser. No. 13,486
Int. Cl. G09b 7/00
U.S. Cl. 35—9 B 14 Claims



A device in which a series of instructions, such as instructions for mathematical operations are supplied in the form of visible or audible signals, and in sequence. At the end of the sequence of instructions, an answer signal is supplied so that the operator of the device can check the accuracy with which the signalled instructions have been followed. For visible signals, the instructions and answers are printed and are made sequentially visible by the sequential energization of respective lamps.

For audible signals, the instructions and answer are voice recordings and are supplied sequentially by way of a transcribing device.

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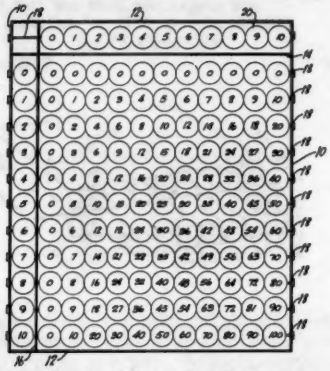
## 3,672,072
## EDUCATIONAL DEVICE

Joseph S. Akiyama, Denver, Colo., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Dec. 11, 1970, Ser. No. 97,157
Int. Cl. G09b 19/02
U.S. Cl. 35—31 B 3 Claims

A rectangular hollow frame contains a plurality of spaced parallel coplanar rods. A plurality of flat coplanar discs are disposed individually rotatably around each rod. The discs are blank on one side and carry numbers on the other.



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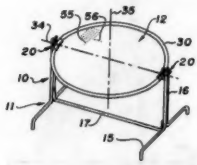
## 3,672,073
## TEACHING APPARATUS

Felix Pilorusso, 4271 West Eleventh Avenue, Vancouver, British Columbia, Canada

Filed Sept. 11, 1970, Ser. No. 71,502
Int. Cl. G09b 23/04
U.S. Cl. 35—34 12 Claims



Apparatus having a panel providing a flat surface which represents a plane and including sets of component parts which can be secured to the panel and to each other as a geometric or other figure. The parts include elongated members which represent lines and/or vectors, spheres to represent points, and various structural components to join the aforementioned parts into a comprehensive three-dimensional figure.

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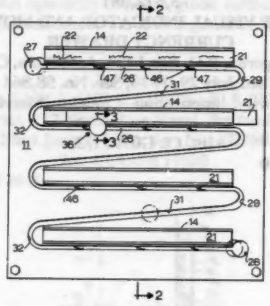
## 3,672,074
## REMEDIAL READING TEACHING DEVICE

Jean M. Huffstetter, 1753 Willowside Road, Santa Rosa, Calif.

Filed July 23, 1970, Ser. No. 57,538
Int. Cl. G09b 17/00
U.S. Cl. 35—35 H 9 Claims

To train students having problems in reading to move the eyes from left to right of an entire line of reading matter and then to move the eyes from the right end of one line to the left end of the next line, a mechanical teaching device is provided. The front face of the device has vertically spaced apart parallel (horizontal) holders into which cards displaying reading material may be inserted. Below each holder is a slot parallel to the holder, and the right end of the top slot is connected by a diagonal slot to the left end of a slot below the next holder, each parallel slot being connected to the next lowermost by a diagonal slot. A pointer is inserted in a hole at the left end or beginning of the top slot and may be removed only from the

right end or finish of the bottom slot. Springs may be positioned at intervals in the slots to prevent the pointer from moving backward and assuring that the reader's eyes follow through in proper reading procedure from beginning to end.



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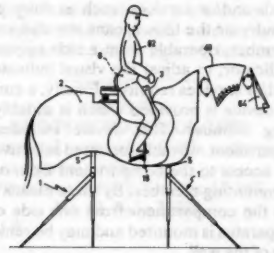
**3,672,075**
**TRAINING APPARATUS**
**Matthijs Johan Eikelenboom, Sweelinckplein 50, The Hague, Netherlands**
**Filed Aug. 21, 1970, Ser. No. 65,780**
**Int. Cl. G09b 9/00**
**U.S. Cl. 35—29 R** **14 Claims**



Apparatus for training and exercise with respect to the mechanical athletic side of horsemanship except for displacement and speed, the apparatus comprising a coordinated structure simulating the trunk, neck and head of a horse and cooperating mechanism providing the motions involved in horsemanship and horseback riding, wherein the trunk includes chest widening and saddle mechanisms and carries a stirrup mechanism, the neck mechanism is pivoted between the trunk and head, and the head carries a bit mechanism and reins for actuating the head and neck by the rider.

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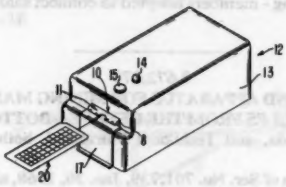
**3,672,076**
**SENSING SOLENOID GRADING SCHEME**
**Daniel D. Miller, Sunnyvale; Donald D. Miller, Saratoga, and James M. Wrenn, Palo Alto, all of Calif., assignors to Miller Scientific Corporation, Los Gatos, Calif.**
**Continuation-in-part of Ser. No. 831,025, June 6, 1969, abandoned. This application April 5, 1971, Ser. No. 131,092**
**Int. Cl. G09b**
**U.S. Cl. 35—48 B** **1 Claim**

Apparatus for scoring multiple choice examinations recorded on answer cards having answers indicated thereupon by means of conventional pencil marks. As used herein, the term "multiple choice" includes any situation where the student chooses between more than one possible answer, such as "true" or "false," "a," "b," or "c," etc. The answer card and the master card are held in registration and placed into the apparatus where photocells detect the presence or absence of ordinary pencil marks in the answer card which are disposed in



locations relative to the master card denoting correct answers. An electrical output signal is given in the event of a wrong answer and a mark is automatically made on the answer card indicating the error.

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**3,672,077**
**SHOE CONSTRUCTION AND METHOD**
**Kyle R. Coles, 3265 Elgin Drive, Salt Lake City, Utah**
**Filed Dec. 14, 1970, Ser. No. 97,491**
**Int. Cl. A43b 23/28; A43d 9/00**
**U.S. Cl. 36—2.5 T** **10 Claims**

A shoe construction including a shoe sole having a plurality of apertures therein. A cleat is removably attached in each aperture and is formed of material having predetermined traction characteristics. Thus, when the shoe construction is used, for example, with bowling shoes, specific cleat compositions for right or left shoes can be selected to best accommodate right or left hand bowlers. The method includes selectively replacing predetermined ones of the cleats with other cleats formed of different material to incrementally change the gripping or traction characteristics of the shoes.

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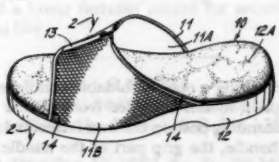
**3,672,078**
**FOOTWEAR**
**Tatsuo Fukuoka, 3,3-Ban, 2-chome Shin-Minami-Fukushima, Tokushima, Japan**
**Filed June 23, 1970, Ser. No. 49,042**
**Int. Cl. A43b 3/12**
**U.S. Cl. 36—11.5** **3 Claims**



A method for producing an injection molded article comprises positioning pre-formed sections made of cloth or the like in the cavity of an injection mold, injecting the molten

resinous material into the remainder of the cavity and cooling the material to a condition under which the latter is cured and integrally connected to the pre-positioned sections. The article produced by the above method comprises at least sections and connecting - members adapted to connect said sections to each other.

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**3,672,079**

**METHOD AND APPARATUS FOR MINING MANGANESE NODULES FROM THE DEEP SEA-BOTTOM**

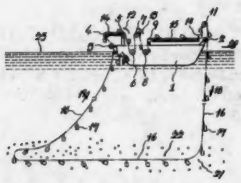
**Yoshio Masuda, and Toshikazu Murakami, both of Tokyo, Japan**

**Continuation of Ser. No. 701,739, Jan. 30, 1968, abandoned. This application April 22, 1970, Ser. No. 28,287**

**Claims priority, application Japan, Feb. 14, 1967, 42/8979**

**Int. Cl. E02f *3/14***

**U.S. Cl. 37—69** **6 Claims**



A mechanism for mining manganese nodules from the deep sea bottom including a number of dredge nets tied to a long endless rope suspended from both sides of a ship, the rope falling from one side of the ship to the deep sea-bottom with apparatus being provided to pull the rope therefrom to another side of the ship, whereby manganese nodules are continuously collected by the dredge nets.

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**3,672,080**

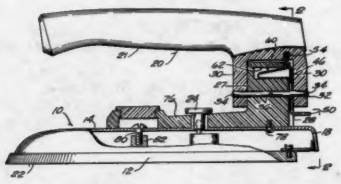
**TRAVEL IRON WITH FOLDING HANDLE**

**Willard Murphy, and Norman A. Beam, both of Macon, Mo., assignors to McGraw-Edison Company, Elgin, Ill.**

**Filed Jan. 13, 1971, Ser. No. 106,153**

**Int. Cl. D06f *75/34***

**U.S. Cl. 38—90** **6 Claims**



A travel iron having a readily foldable cantilevered handle connected by pivot means extended front to rear of the iron between an upstanding post on the iron frame and lateral projection of the handle, the grip part of the handle in the collapsed position being closely adjacent one side of the frame and in the elevated position being centrally spaced over the frame, and a spring biased lock cooperating as between the post and handle to releasably hold the handle in the elevated position while having a cam lead on surface to permit handle setup to the elevated position without manipulation of the lock itself.

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**3,672,081**

**SERVICE VISUAL INDICATOR AND MOVABLE CURRENCY DRAWER**

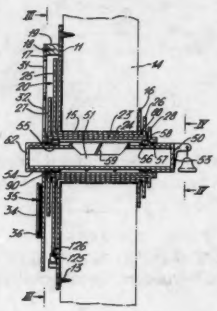
**Gaetan G. Bergeron, P.O. Box 1324, Assiniboia, Canada**

**Filed July 29, 1970, Ser. No. 58,861**

**Claims priority, application Canada, March 13, 1970, 077,402**

**Int. Cl. G09f *11/23***

**U.S. Cl. 40—70** **6 Claims**



A wall-mountable delivery service aid is provided. It includes a mounting member. Means are provided on the mounting member visually to indicate on one side thereof required goods and/or services, such as dairy products, drycleaning, laundry or the like. Means are also provided in the mounting member, operable from a side opposite to that of the visual indicator, to adjust the visual indicator to indicate the goods and/or services required. Finally, a currency storage and transfer device is provided which is slidably mounted on the mounting member. This device includes a currency storage compartment movably mounted selectively to position the same for access to the compartment from one side or the other of the mounting member. By these means currency may be placed in the compartment from one side of the wall on which the apparatus is mounted and may be removed from the opposite side of the wall.

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**3,672,082**

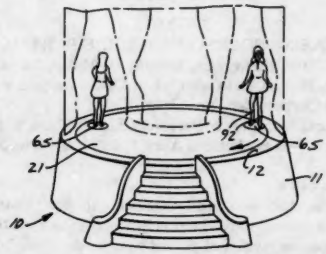
**WALKING MECHANISM FOR A DOLL**

**Sidney Tepper, Millburn; William Tierney, Bellville, and Nicholas Lilinga, Montclair, all of N.J., assignors to Topper Corporation**

**Continuation-in-part of Ser. No. 55,909, July 17, 1970. This application Oct. 20, 1970, Ser. No. 85,847**

**Int. Cl. G09f *19/08***

**U.S. Cl. 40—106.36** **11 Claims**



A mechanism including a support and two elements carried by the support for engaging the legs of a doll. The support car-

ries a pivotable arm, and slots in the support and arm cross each other. A pin connected to each element passes through both slots, and the arm oscillates with respect to the support by engaging stationary abutments along the path of travel of the support. An upwardly concave guide surface on the support causes the elements to move along an arcuate path.

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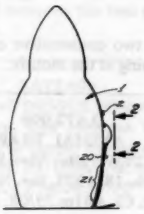
**3,672,083**
**INFLATABLE AND ILLUMINABLE FIGURE**
**James G. Moran, 122 North Rose Street, Burbank, Calif.**
**Filed June 3, 1970, Ser. No. 42,968**
**Int. Cl. G09f *19/00***
**U.S. Cl. 40—126 B** **6 Claims**



An inflatable and illuminable figure in which the figure is provided with a window of transparent plastic material bordered by attachment pockets, and a cell containing a light source and having a convex window is secured to the figure by tabs which are received in the pockets and secured therein by a gripping force created when the figure is inflated.

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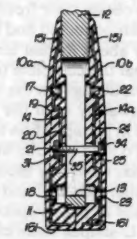
**3,672,084**
**REINFORCED PISTOL GRIP**
**Frank A. Pachmayr, Los Angeles, Calif., assignor to Mershon Company, Los Angeles, Calif.**
**Filed June 8, 1970, Ser. No. 44,347**
**Int. Cl. F41c *23/00***
**U.S. Cl. 42—71 P** **7 Claims**



A pistol grip is formed by molding similar rubber sections of rubber internally reinforced by apertured metallic stampings having progressively increasing concavities toward the butt end of the grip and from flattened terminals at their opposite ends, the stampings being fully embedded in the rubber and conformed to the shape of the grip.

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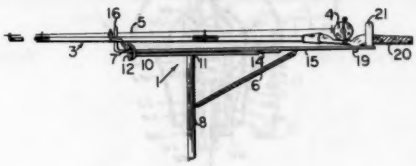
**ERRATUM**

For Class 42—50 see:
Patent No. 3,672,089

**3,672,085**
**AUTOMATIC HOOK SETTING DEVICE**
**George W. King, P.O. Box 144, Gower, Mo.**
**Filed May 13, 1970, Ser. No. 36,786**
**Int. Cl. A01k *97/00***
**U.S. Cl. 43—15** **1 Claim**



An automatic hook setting device for an unattended fishing pole comprises a vertically extending standard having one end adapted to be firmly anchored in a fixed position and an elongated transversely extending bar fixedly mounted on an upper end of the standard. An elongated rod is pivotally mounted on the bar intermediate its ends and has a pole cradle adjacent one end and a holding member adjacent the other end thereof for holding a fishing pole handle. A releasable catch member is pivotally mounted on the rod for engaging the bar and has a trigger portion positioned to have a fishing line looped therearound. Spring means is connected to the rod to move same and the fishing pole thereon to set a fish hook when a fish pulls on the line to release the catch member.

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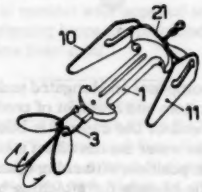
**3,672,086**
**DEMOUNTABLE FISHING LURE WITH INTERCHANGEABLE ELEMENTS**
**Giansandro Terreni, Via Montesanto, Luino, Italy**
**Filed Feb. 4, 1970, Ser. No. 8,611**
**Int. Cl. A01k *85/00***
**U.S. Cl. 43—42.09** **6 Claims**



An artificial fishing lure is disclosed, which can be variously transformed by inserting or removing some parts thereof. This fishing lure essentially comprises a central frame to which various spoon baits, sinkers, blades, fish hooks and the like can be connected. Said central frame consists of a main body with a central longitudinal slot, two pairs of opposite projections, an upper connection member for attachment to the fishing line and a lower fastener means for securing the fishing hook and the like.

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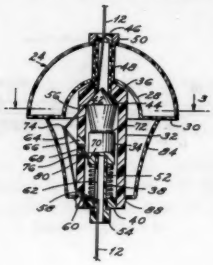
**3,672,087**
**FISHING BOBBER MECHANISM**
**Raymond E. Milburn, Jr., Route 1, P.O. Box 128, Round Lake, Ill.**
**Filed Dec. 17, 1970, Ser. No. 99,160**
**Int. Cl. A01k *93/00***
**U.S. Cl. 43—44.88** **7 Claims**

A fishing bobber having a hollow float and a yieldably biased plunger slidably received in a chamber to engage a por-

tion of a fishing line extending through the float. A latch tripped by a rapid upward movement of the line releases the plunger to engage the line and restrain its movement through the float.



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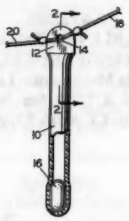
**3,672,088**
**FISHING SINKER**
**Russell E. Sells, 1331 N.E. Marine Drive, Portland, Oreg.**
**Filed Sept. 17, 1969, Ser. No. 858,720**
**Int. Cl. A01k *95/00***
**U.S. Cl. 43—44.97** **1 Claim**



A fishing sinker comprises an elongated sealed cylinder having secured in its bottom end a weight of predetermined magnitude. The upper end of the capsule is buoyant. When the sinker is immersed in water the net effect is to maintain it in a substantially upright position. Attaching means is provided at the upper end of the capsule for attaching both the rod line and the hook line. Accordingly, when the sinker with attached hook are drawn through the water, or allowed to rest on the bottom of a stream of water where there is current flow, the fish hook tends to be elevated slightly above the bottom and the danger of snagging both sinker and fish hook are minimized.

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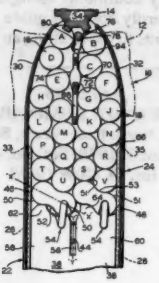
**3,672,089**
**LARGE CAPACITY MAGAZINE**
**Stanley D. Silsby, Granby, Mass., assignor to The United States of America as represented by the Secretary of the Army**
**Filed Aug. 13, 1969, Ser. No. 849,635**
**Int. Cl. F41c *25/02, 25/08***
**U.S. Cl. 42—50** **7 Claims**

A large capacity magazine of practical proportions feeds cartridges successively from four columns to a mouth ready for pickup by the reciprocating firearm bolt. During displacement towards the mouth the cartridges are separated by a divider into the two double columns which are in turn converted into single columns by cams on the divider arranged in combination with curved sides of the magazine so that two cartridges are fed consecutively to the mouth from one side of the divider followed by two consecutive cartridges on the other side to prevent jamming at the mouth.



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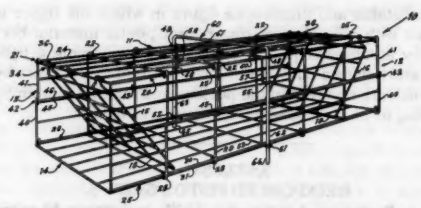
**3,672,090**
**ANIMAL TRAP**
**William B. Sonntag, 2939 Valley View Drive, Fairborn, Ohio**
**Filed Feb. 18, 1971, Ser. No. 116,389**
**Int. Cl. A01m *23/08, 23/18***
**U.S. Cl. 43—66** **6 Claims**



A collapsible box-like animal trap of the type which includes inwardly sloping end walls or doors which are pivotable about the top and engage the bottom of the trap at a point spaced inwardly from the front edge of the bottom wall. The ends are held closed by gravity such that animals may push the bottoms of the doors inwardly and upwardly to an open position and thereby gain access to the interior of the trap but may not push it outwardly to obtain their freedom. The walls of the trap are all hingedly interconnected and side walls of the trap are collapsible inwardly about medial hinges located midway up the side walls such that the complete trap may be collapsed by folding the doors inwardly against the top of the trap and by folding the side walls inwardly until the medial hinge line of each side wall is located in juxtaposition to the medial hinge of the opposite side wall. To hold the trap in an erected position, a U-shaped stake extends upwardly along one side wall over the top and down the other side wall and passes through loops attached to the side walls at points spaced from the corners. The bottom ends of the U-shaped stake extend into the ground and serve the function not only of holding the trap in an erected condition but preventing it from being rolled by an entrapped animal.

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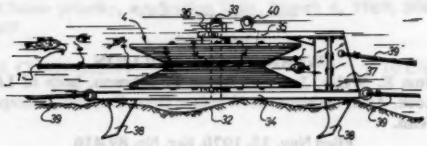
**3,672,091**
**ENDLESS FISHING CABLE INSTALLATION**
**Emeric Cloutier, Rue Principale, Mont St. Pierre, Gaspe-North, Quebec, Canada**
**Filed May 11, 1970, Ser. No. 39,192**
**Int. Cl. A01k *79/00, 91/00***
**U.S. Cl. 43—27.4** **2 Claims**

A fishing installation having an endless cable to which are attached a number of fish-lines in spaced-apart relationship.

along the length of the endless cable which is supported by two shore pulleys and one offshore submerged pulley mounted on a baseplate adapted to be anchored at the bottom of a body



of water. The two shore pulleys are pivotable up and down relative to an horizontal axis and an endless cable advance mechanism is provided between the two shore pulleys to advance the endless cable.

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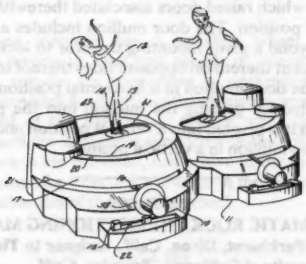
**3,672,092**
**ANIMATING DEVICE FOR A DOLL**
**Sidney Tepper, Millburn, and Nicholas Lalinga, Montclair, both of N.J., assignors to Topper Corporation**
**Filed July 29, 1971, Ser. No. 167,383**
**Int. Cl. A63h *33/00***
**U.S. Cl. 46—1 R** **14 Claims**



Each foot of a doll is connected by an element to one of a pair of movable racks which, respectively, sit in a pair of parallel grooves located in a rotatable base. The rotatable base and a stationary gear whose teeth engage the racks are both supported by a base plate. When the rotatable base is oscillated by a lever coupled to the base and driven by a motor, the racks move the feet in opposition directions. A third rack is coupled to the base plate and the base plate is slidably mounted for radial movement relative to a rotatable platform mounted in a housing. The rotatable platform includes a radial slot through which the elements connected to the doll extend. A shaft having a pinion which engages the third rack is supported on the rotatable platform. Accordingly, rotation of the shaft moves the doll radially, and angular movement of the shaft rotates the rotatable platform and the doll.

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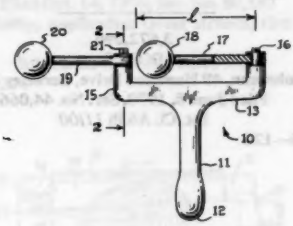
**3,672,093**
**HAND HELD WEIGHT SWINGING TOY**
**Samuel W. Meek, Sr., P.O. Box 342, Pocola, Okla.**
**Filed June 25, 1971, Ser. No. 156,868**
**Int. Cl. A63h *1/32***
**U.S. Cl. 46—47** **7 Claims**

A hand held weight swinging apparatus comprised of a frame handle from which there outwardly depends spaced apart shafts, with each shaft receiving the end of an arm in journaled relationship thereon. The free depending end of the arm is attached to a weight in the form of a ball so that when the frame is properly held in one's hand and manipulated, each of the balls may be pivotally swung about their respective shafts, with the direction of rotation being clockwise, counterclockwise, or in opposed direction with respect to one



another, dependent upon the manner in which the handle is manipulated.

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**3,672,094**
**EXERCISING DEVICE**
**Benito Vigorito, 2318-82nd Street, Brooklyn, N.Y.**
**Filed Nov. 24, 1970, Ser. No. 92,416**
**Int. Cl. A63h *1/32***
**U.S. Cl. 46—62** **4 Claims**

An exercising device consists of a disc of preselected diameter and width and is provided with a central bore and a plurality of smaller bores uniformly spaced about the central bore. A low twist cord is threaded through the plurality of smaller bores such that a cross of cord passes over the central bore; a further double strand of low twist cord is threaded through the central bore and in contact with opposed sections of the cross cord, and hand gripping loops are provided at the ends of the double strand of low twist cord.

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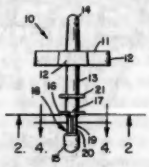
**3,672,095**
**TOP GAME AND APPARATUS**
**Adolph E. Goldfarb, Tarzana, and Rene Soriano, Los Angeles, both of Calif., assignors to Adolph E. Goldfarb**
**Division of Ser. No. 807,299, March 14, 1969, abandoned.**
**This application Oct. 14, 1970, Ser. No. 80,675**
**Int. Cl. A63h *1/02***
**U.S. Cl. 46—65** **9 Claims**



A top game comprising (a) a plurality of spinner units, each of which is the combination of a spindle-type top, a holding means detachably connected to the top so as to support the top but be readily releasable from it, and a string attached to the holding means for winding around the top; and (b) a stadium having a plurality of wall receivers or receiving means for

each receiving and supporting a spinner unit so that the holding means may be pulled simultaneously or in rapid succession to spin the tops and introduce them into the stadium for engagement with one another.

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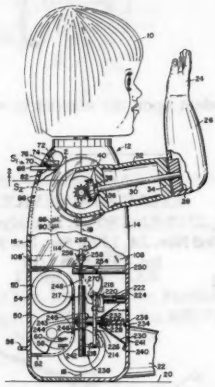
**3,672,096**
**DOLLS**
**Frank T. Johmann, 49 Hampton Drive, Berkeley Heights, N.J.**
**Filed June 8, 1970, Ser. No. 44,066**
**Int. Cl. A63h *11/00***
**U.S. Cl. 46—120** **8 Claims**



This invention relates to a doll driven by a motor, preferably battery operated, which may move its hands through a number of different positions. The doll may include a sound-reproducing unit and may also move her mouth so as to appear to talk. The doll may also move her head or eyes. Dolls of the invention can be made in varying degrees of complexity to include all or part of any of the preceding activities. Dolls of the invention can be made which can actively participate with a child in playing games such as "Peek-A-Boo," "Simon Says," or other similar games involving movement of arms and hands.

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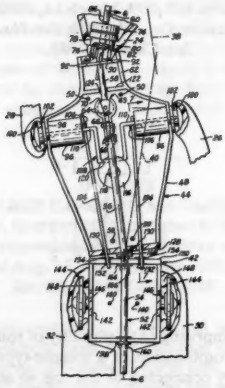
**3,672,097**
**CRANK OPERATED DANCING DOLL**
**Robert Gardel, New York, N.Y., and Egon Gorsky, Westfield, N.J., assignors to Mattel, Inc., Hawthorne, Calif.**
**Continuation-in-part of Ser. No. 866,953, Oct. 16, 1969, Pat. No. 3,609,909. This application Oct. 15, 1970, Ser. No. 80,890**
**Int. Cl. A63h *11/00***
**U.S. Cl. 46—120** **2 Claims**



A doll having animated torso, arms and head movement. The torso is comprised of an upper and lower portion, the upper portion of which gyrates with respect to the lower portion. The arms swing alternately in a forward and backward movement. The head gyrates at the same time the torso is gyrating. A crank is provided for manually moving the arms, torso, and head of the doll.

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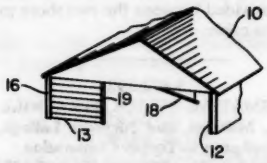
**3,672,098**
**SWING-UP DOOR MULLION**
**Cleitus E. Webb, Jr., and Royce F. Johnson, both of Little Rock, Ark., assignors to Windsor Door Co., Inc., Memphis, Tenn.**
**Filed Nov. 13, 1970, Ser. No. 89,416**
**Int. Cl. E06b *5/00***
**U.S. Cl. 49—365** **10 Claims**




A door mullion for hangar style doors pivoted at the top to swing from a vertical position, in which doors associated therewith are permitted to open and close, into a horizontal position in which raised doors associated therewith are locked in a raised position. The door mullion includes a portion extending beyond a pivot mounting therefor to lock one of two doors adjacent thereto on opposite sides thereof in an up position with the door mullion in a horizontal position. Means are also provided for guiding the mullion into the plane of the doors when it is pivoted into a vertical position and for locking the swing-up mullion in a vertical position.

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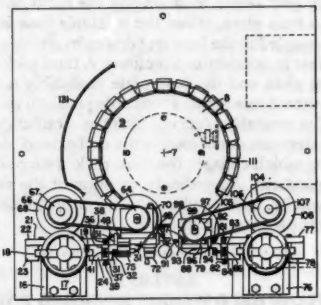
**3,672,099**
**AUTOMATIC ROCK THINSECTIONING MACHINE**
**George R. Parkhurst, Dixon, Calif., assignor to The Regents of the University of California, Berkeley, Calif.**
**Filed Sept. 3, 1970, Ser. No. 69,381**
**Int. Cl. B24b *7/04***
**U.S. Cl. 51—3** **2 Claims**



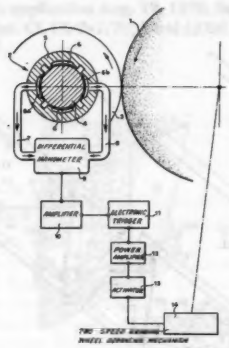
A machine for thinsectioning rock specimens includes a turntable intermittently rotatable on a frame to carry specimens in holders to a saw station at which a rotary saw on an arbor is motor driven and is mounted for adjustment of its rotational axis in various directions and then to a grinder station in which a motor driven grinder is likewise mounted for rotation about an axis movable into various different positions and to be approached more or less closely to the rock specimen on the turntable.

3,672,100

## SPEED CONTROL DEVICE

Manlio Pesante, Turin, Italy, assignor to RIV-SKF Officine di Villar Perosa S.p.A., Turin, Italy

Filed Feb. 27, 1970, Ser. No. 14,907
Claims priority, application Italy, March 4, 1969, 50838-A/69
Int. Cl. B24b 49/08
U.S. Cl. 51—165.77 10 Claims




A grinding machine has a grinding wheel advancing mechanism having at least two speeds of operation, and a hydrostatic spindle for supporting a workpiece. Detector means are provided for detecting the change in pressure of the support fluid of the hydrostatic spindle when the grinding wheel contacts the workpiece supported on the spindle. Speed changing means are provided, responsive to the output of the detector means, for effecting a change in the speed of the advancing mechanism of the grinding wheel.

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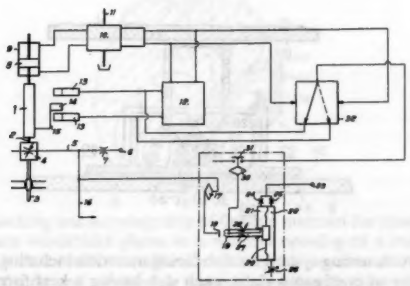
3,672,101

## LAPPING OR MICRO-MACHINING TOOLS

Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed May 25, 1970, Ser. No. 40,080
Claims priority, application France, May 30, 1969, 6916427
Int. Cl. B24b 49/00
U.S. Cl. 51—165.93 6 Claims



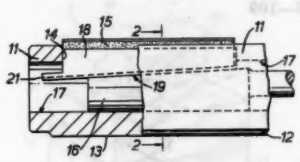
Improvement in a machine for lapping or micro-machining whereby the direction of longitudinal movement of the tool is reversed when a rapid drop in torque resistance between the tool and the work piece occurs. The machine comprises a longitudinally reciprocated mounting which carries a rotary spindle attached to a machining tool through a torque detector.

3,672,102

## HONING TOOLS

Donald Edgar Johnson, Cheltenham, England, assignor to Delapena Honing Equipment Limited

Filed Oct. 14, 1970, Ser. No. 80,557
Claims priority, application Great Britain, Oct. 17, 1969, 51,013/69
Int. Cl. B24d 17/00; B24b 5/06
U.S. Cl. 51—204 7 Claims



A honing tool has an abrasive stone fixed within a shell which is movable radially of the tool by means of an axially displacable wedge member. The shell comprises a channel of constant width and tapering depth which is formed from a sheet metal blank by pressing.

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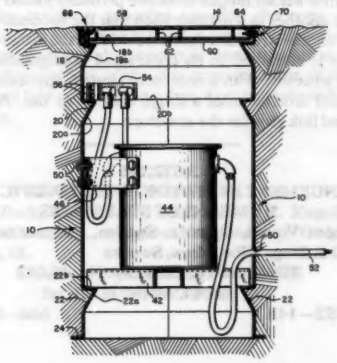
3,672,103

## MODULAR UTILITY VAULT

Robert A. Kost, Fort Collins, Colo., assignor to City of Fort Collins, Ft. Collins, Colo.

Filed Dec. 31, 1969, Ser. No. 889,615
Int. Cl. E02d 29/14; H02g 9/10
U.S. Cl. 52—20 6 Claims



A modular construction for underground utility vault. Semi-cylindrical end sections are molded in the form of a relatively thin shell from fiberglass or other moldable material of similar physical characteristics. The shells are formed with a series of radially offset circumferentially extending ribs which provide increased rigidity to the shell and also form shelves for supporting elements such as transformers, connection points, etc. within the vault. The end section is one form of structural module which may, in some installations, be combined with a second modular element in the form of a flat side panel having a cross-sectional configuration matching that of the end section. Two end sections may be secured to each other to form a cylindrical vault or, alternatively, two end sections may be assembled with one or more pairs of side panels attached to and mounted between the opposed end sections. A cover element of laminated molded sheet material closes the opening at the upper end of the completed vault and is provided with internal stiffening ribs. A lock and retainer-hinge assembly is employed to releasably lock the cover in position and enables the

cover, when unlocked, to either be swung upwardly as on a hinged mounting or removed entirely.

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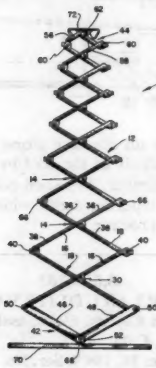
**3,672,104**

## NESTING THREE DIMENSIONAL LAZY TONG STRUCTURE

George R. Luckey, Playa Del Rey, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Dec. 23, 1970, Ser. No. 100,912
Int. Cl. E04h *12/10*
U.S. Cl. 52—109 10 Claims



A nesting three-dimensional lazy tong structure of hollow polygonal cross-section having tapered sides provided by lazy tong frames whose hinged links are pivotally joined and cross-over one another in a manner such that the successive link sets or tiers of the structure nest one within the other when the structure is retracted to its contracted configuration to provide the structure with a contracted length approximating the contracted dimension of a single link set or tier. A lazy tong frame and link pair for the structure.

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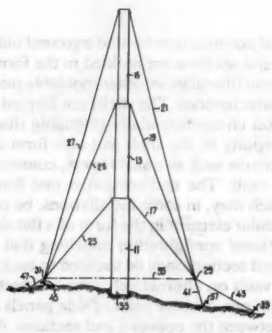
**3,672,105**

## ARRANGEMENT IN STAYING A TELESCOPIC TOWER BY MEANS OF STAY WIRES

Lars Anton Wessel, Uppsala, Sweden, assignor to AB Wikstrand & Berg, Wibe, Mora, Sweden

Filed June 16, 1970, Ser. No. 46,662
Int. Cl. E04h *12/20*
U.S. Cl. 52—148 2 Claims



A telescopic tower is stayed by wires extending in three or four vertical planes. In each plane the wires connected to the tower at different levels have their lower ends connected to a point situated somewhat above the ground which point is anchored to the ground. All of said connection points are situated in the same horizontal plane.

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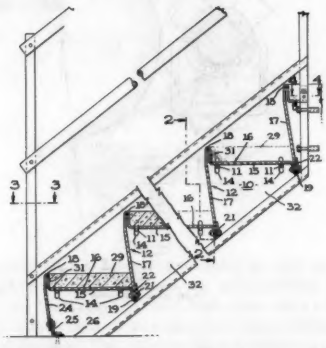
**3,672,106**

## STAIR STRUCTURE

Thomas C. Mulitz, Silver Spring, Md., assignor to Pico Safe Stairs Co., Hyattsville, Md.

Filed Aug. 13, 1970, Ser. No. 63,491
Int. Cl. E04f *11/12*
U.S. Cl. 52—188 6 Claims



A stair structure fabricated from riser-tread units each having an inverted U-shaped nosing forming a trough or pan at the tread portion, in combination with the sides of supporting channels and the lower portion of the next higher riser, into which concrete or similar material is poured. The rear of the tread portion forms a U-shaped groove extending below the bottom of the pan surface for receiving the lower edge portion of the next higher riser portion therein.

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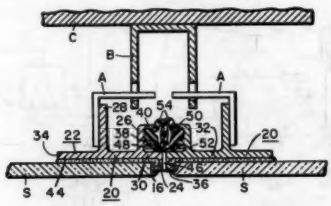
**3,672,107**

## GRIPPING AND SEALING SYSTEM FOR SLAB FACING MATERIALS

George J. Santry, New Canaan, Conn., and Harold R. Wacenske, Campbell, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 11, 1970, Ser. No. 36,298
Int. Cl. E04b *2/88*
U.S. Cl. 52—235 10 Claims



A mounting system for slab facing materials including a plurality of contiguous slabs, each slab having a kerf formed in the peripheral edges thereof. This system includes a structural channel member for each facing slab edge, with the structural channel members having first flange portions for cooperatively gripping each slab, and second flange portions with the second flange portions of adjacent channel members of two contiguous slabs defining first and second plunum chambers. Spline means inserted into the first plenum chamber act as both a moisture stop and an air pressure equalizer while gasket

means are inserted into the second plenum chamber for cushioning and sealing purposes. Third flange portions of the channel members serve as a joiner member for attachment lugs. Structural channel members for corner joints are also set forth.

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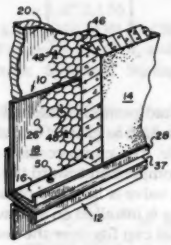
3,672,108

## JOINT CONSTRUCTION

Donald J. Conway, Glenview, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Division of Ser. No. 771,821, Oct. 30, 1968, Pat. No. 3,568,391. This application Aug. 19, 1970, Ser. No. 65,351
Int. Cl. E04b 1/70; E04f 13/06
U.S. Cl. 52—367 7 Claims



A stucco-covered, curtain wall construction employs a joint including an elongate L-shaped casing bead and an elongate generally wing-shaped drainage cap member. The two joint components form a horizontally-disposed, structurally yielding joint between outer covering panel sections. The two joint components provide ventilation and water drainage between the windward and leeward sides of the wall.

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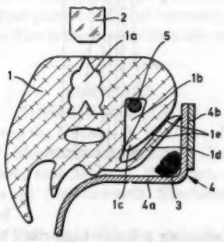
3,672,109

## PACKING AND SECURING STRIP FOR WINDSHIELDS

Karl Erck, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed March 19, 1970, Ser. No. 21,063
Claims priority, application Germany, March 21, 1969, P 19 14 350.1
Int. Cl. E06b 3/54, 3/56
U.S. Cl. 52—400 3 Claims



A packing and securing strip of flexible material for mounting glass windshield plates in a window opening of a metal frame with the aid of an adhesive with the strip mounted in the metal frame and a covering lip and a holding lip in contact with the frame.

During mounting of the plate and securing strip in the frame opening, the covering lip lies between the adhesive and the holding lip to prevent contact between the adhesive and the holding lip. After the plate and strip are pressed into the opening, the holding lip is drawn from between the covering lip and the body of the strip and over a flange of the opening, in a known manner.

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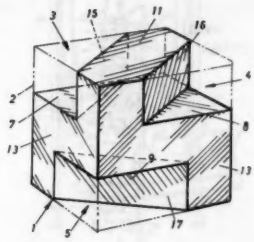
3,672,110

## BUILDING BLOCK

Per Christer Nordstrom, Nordenskialdsgatan 20, S-413 09 Goteborg, Sweden

Filed Jan. 28, 1971, Ser. No. 110,527
Claims priority, application Sweden, Jan. 22, 1971, 1978/70
Int. Cl. E04c 1/18, 2/30
U.S. Cl. 52—608 5 Claims



A building block for erection of interior and exterior walls, partitions and like structures. The building block is shaped in such a way that by combining it in various ways it makes possible to obtain walls providing simultaneously building-technical advantages and aesthetical effects. The basic shape of the building block is, in the preferred embodiment, that of a cube from which four corner pieces have been cut away such that four triangular faces are formed in the cubic body. These triangular faces extend essentially in parallel with two opposite side faces of the cube, and have two of its sides contiguous to two of the remaining, non-opposite walls of the cube. The sides of the cut-away triangles opposite the apex define a rectangular face extending in pairs in parallel relationship with one diagonal line, and also in pairs in parallel relationship with the other diagonal line of the side opposite faces of the cube, one diagonal line crossing the other diagonal line preferably at right angles.

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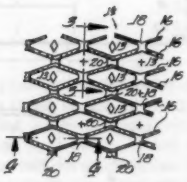
3,672,111

## RETICULATED BAR GRATING

Lester T. Deck, Park Forest, and Fredrick E. Kupsky, Villa Park, both of Ill., assignors to Stanoray Corporation, Chicago, Ill.

Filed Nov. 29, 1968, Ser. No. 779,815
Int. Cl. E04c 2/42; E04f 11/16
U.S. Cl. 52—666 8 Claims



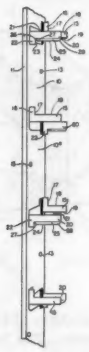
A reticulated sheet employs transversely extending strips formed from said sheet and disposed substantially normal to the general sheet plane so as to afford reinforcement against bending forces acting normal to such plane. Additional reinforcement is afforded by elongate reinforcements secured to saddle portions of said sheet integrally formed with said strips whereby loads applied to said sheet are uniformly distributed throughout the sheet.

3,672,112

## BRICK HANGERS

James B. Sions, 8903 Allandale Road, Richmond, Va., and Wesley A. Gramling, 6804 Glenmont Street, Falls Church, Va.

Filed April 2, 1970, Ser. No. 25,167
Int. Cl. E04b 13/14
U.S. Cl. 52—712 4 Claims



Brick hanger strips to be applied to a wall or other flat surface in parallel rows or columns, and having outstanding lugs between which individual bricks are inserted to be held in uniformly spaced mutual relationship and at a predetermined distance from the wall, the spaces between the bricks then generally being filled with grout or other suitable filler to provide the appearance of a finished masonry structure.

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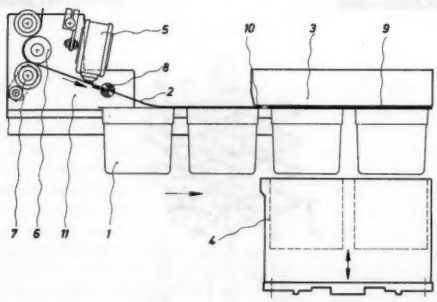
3,672,113

## PROCESS AND APPARATUS FOR SECURING COVERING MATERIAL IN PROPER ALIGNMENT TO A SERIES OF CONTAINERS

Rolf Andra, Schmiden, Germany, assignor to Hofliger & Karg, Stuttgart, Germany

Filed May 7, 1970, Ser. No. 35,424
Claims priority, application Germany, May 8, 1969, P 19 23 431.2
Int. Cl. B65b 7/00, 41/18
U.S. Cl. 53—39 4 Claims



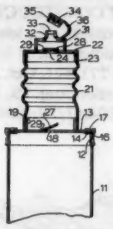

The leading edge of a sheet of covering foil is sealed to the leading rim of a container of a row of several containers to ensure correct positioning of the foil on the containers, while the covering sheet previously sealed to the leading rim of a container is now completely sealed over the tops of its several containers.

3,672,114

## DEVICE FOR EVACUATING CONTAINERS

Alvin H. Sacks, 12682 Roble Veneno, Los Altos Hills, Calif.

Filed Jan. 11, 1971, Ser. No. 105,335
Int. Cl. B65b 31/02
U.S. Cl. 53—88 4 Claims



A manually-actuated pump is attached to the lid of a container for substances such as ground coffee, which deteriorate in the presence of air. The pump consists of a cylindrical bellows which can be compressed toward the lid and extended. A first flap-type check valve is installed on said lid and a second flap-type check valve is installed on a closure on the outer end of the bellows. A seal cap fits over the second valve to maintain the vacuum once the container has been evacuated.

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3,672,115

## METHOD OF ERECTING SUPER-HIGH-RISED TOWER STRUCTURE

Kaoru Abe, Hiroshima; Takeji Matsumoto, Itsukaichicho, and Nobuo Itoki, Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Chiyoda-ku, Tokyo, Japan

Filed Oct. 29, 1970, Ser. No. 85,126
Claims priority, application Japan, Nov. 4, 1969, 44/88219
Int. Cl. E04h 12/00; E04g 1/20
U.S. Cl. 52—741 2 Claims

A method of erecting a super-high-rised towery structure, which comprises assembling the lowermost segment of the towery structure on a foundation in fixed relation thereto, assembling the uppermost segment of a cylindrical body within the thus assembled lowermost segment of the towery structure in such a manner that it is supported upright by the horizontal members of said lowermost segment, said uppermost segment of the cylindrical body having a crane mounted at the top end thereof, lifting said uppermost segment of the cylindrical body by push-up means or hoisting means, connecting the next lower segment of said cylindrical body to the lower end of said uppermost segment of the same, assembling the next higher segment of the towery structure on top of said lowermost segment of the same while hoisting the structural members

thereof by said crane, again lifting the assembly of the uppermost and the next lower segments of said cylindrical body and connecting the next lower segment of the cylindrical body to the lower end of said assembly, repeating the above-described steps to construct the segments of the towery structure to a predetermined height, constructing a platform of a sufficient width on top of the thus assembled portion of the towery structure in fixed relation thereto, carrying up the construction materials required for the construction of the remaining segments of the towery structure from the ground onto said platform by means of another crane mounted on said platform, and assembling the remaining segments of the towery structure while hoisting the structural members thereof from said platform by the crane at the top end of said uppermost segment of the cylindrical body.

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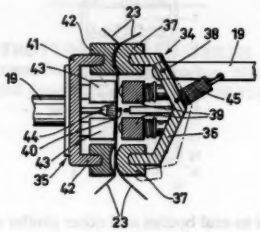
**3,672,116**

## METHOD AND MACHINE FOR PACKAGING GOODS

**Martin Ingmarson, Vallingby, Sweden, assignot to Kooperativa forbundet ekonomisk forening, Stadsgarden, Stockholm, Sweden**

**Filed May 11, 1970, Ser. No. 36,370**
**Int. Cl. B65b** *11/10, 11/48, 51/30*
**U.S. Cl. 53—3** **13 Claims**




A method and apparatus for wrapping a film having an elasticity sufficient to stretch without bursting about four sides of an object, in which the object is moved into a loop of the film between two supply rollers and the film is fed from the supply rollers at a rate such that the film is stretched adjacent the fourth side of the object are then brought together and clamped along a first line while the film is still under tension. The tension on the portions of film brought together is then released. Thereafter, the portions of the film adjacent the fourth side of the object are again clamped along a line parallel to the first line of clamping. The portions of film are then welded along a line parallel to and between the two lines of clamping, and the film is then cut within the weld.

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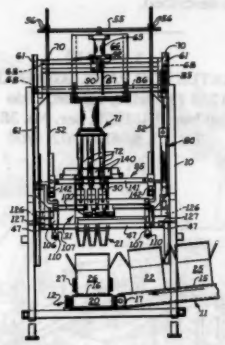
**3,672,117**

## HINGE PAN PACKER

**James J. Shuttleworth; Carlton S. Sprague, both of Huntington; Howard P. Shuttleworth, Warren; Charles E. Zimmerman, Huntington, and John A. Wiseman, Anderson, all of Ind., assignors to Shuttleworth Machinery Corporation, Huntington, Ind.**

**Filed Feb. 26, 1970, Ser. No. 14,336**
**Int. Cl. B65b** *5/06, 35/38*
**U.S. Cl. 53—35** **10 Claims**

Case packing method and apparatus wherein aerosol cans or other objects are moved from a conveyor onto a support plate hingedly mounted on a vertically movable carriage including grid guide fingers. A box conveyor positions a box under the carriage. A vacuum head is movable downwardly into engagement with the objects, whereupon the vacuum head attaches to the objects. The vacuum head continues to move downwardly until the objects are placed in the box and the vacuum is turned off. The vacuum head is then returned to its starting position. During the downward stroke of the head, the carriage is first stationary until the head attaches to the objects. Then the carriage moves with the head until the guide fingers are inserted into the box and are holding it in position. Next the support swings on the carriage out from under the



objects. The carriage is then stopped and the head passes through the carriage and the guide fingers to place the objects in the box.

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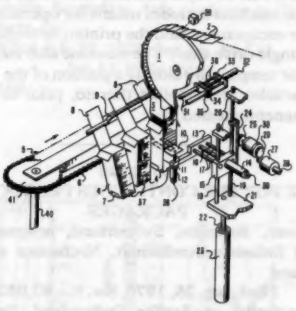
**3,672,118**

## CARD PACKAGING APPARATUS

**Egbert D. De Jong, Amstelveen; Hans Koch, Amsterdam, both of Netherlands, and Kenneth B. Maynard, Belle Mead, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Feb. 5, 1971, Ser. No. 112,989**
**Claims priority, application Netherlands, March 9, 1970, 7003290**
**Int. Cl. B65b** *57/20*
**U.S. Cl. 53—59 R** **5 Claims**



This apparatus packages a preselected number of like small flat items, such as cards, directly in a series of cartons. Each carton, when loaded, is automatically removed from a loading station and replaced by an empty carton, while cards are supplied to the station without interruption. Cards are delivered successively from a conveyor above the loading station and dropped flatwise, while guided by a cage, to form a stack on a platform that is moved downwardly within the open front of the carton so as to keep the top of the stack at a substantially constant height within the cage. An electronic counter causes the platform to move downward according to the speed at which cards are supplied to the stack. When the counter reaches the preselected number, a knife moves horizontally into the cage to temporarily support the stream of cards while the platform moves rapidly downward to a lower limit position and is then withdrawn from the carton, leaving the stack in the

carton. The loaded carton is then automatically advanced from the loading station, while an empty one is being moved into said station. Meanwhile, the platform is withdrawn, raised, and then moved into the open front of the empty carton; whereupon the knife is removed and the empty carton is loaded as above described.

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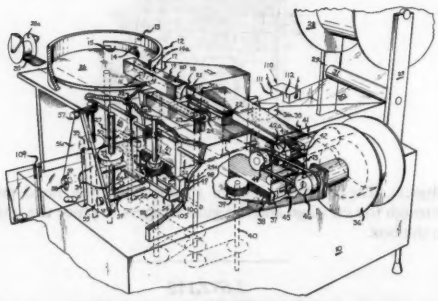
**3,672,119**
**APPARATUS FOR PACKAGING ARTICLES**

**Larry C. Gess, 1255 Fir Drive, Toledo, Ohio**

**Filed May 18, 1970, Ser. No. 38,143**
**Int. Cl. B65b** *61/02, 9/06*
**U.S. Cl. 53—131** **13 Claims**



A machine is provided for packaging articles in flexible sheet material. An improved, simplified drive for the machine operates components thereof with a minimum of controls and mechanical elements. The machine includes a feeder that supplies articles to an escapement which delivers a predetermined number of the articles to a package enclosure as it is being formed of the flexible sheet material. The sheet material is in strip form and is longitudinally advanced by feed rolls at intervals, the contents being printed on the material which is subsequently transversely sealed, when stopped. After the material is sealed, it can be separated into individual packages. The drive for the machine includes means for operating the sealing devices, the escapement, and the printer, in timed relationship through a single drive shaft. The machine also includes closure members for temporarily closing a portion of the sheet material before articles are supplied thereto, prior to the material being permanently sealed.

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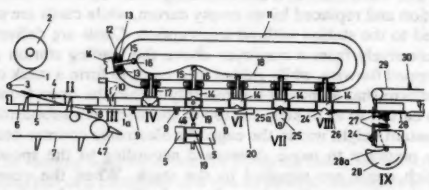
**3,672,120**
**DEVICE FOR THE CONTINUOUS PRODUCTION OF PACKAGES**

**Hans Heinzer, Beringen, Switzerland, assignor to Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland**

**Filed Aug. 26, 1970, Ser. No. 67,052**
**Claims priority, application Switzerland, Sept. 4, 1969, 13414/69**
**Int. Cl. B65b** *9/06, 11/12*
**U.S. Cl. 53—180** **7 Claims**



A band of wrapping material is continuously withdrawn with uniform speed from a supply roll and wrapped tubularly about rectangular articles supplied to said band with the same speed and moving lengthwise always in the same direction. Transversely moving cutting devices and folding members—which during their operational movement also are moved with uniform speed lengthwise with the tubular wrapping and the articles therein—firstly cut into the tubular wrapping, of course between the articles therein, then fold the end portions of the wrappings projecting from the articles against the ends and bottom of the articles, and finally the completed packages are separated from each other by cutting a single longitudinal bottom flap which was formed on the wrapping at the time it was wrapped tubularly around the uniformly spaced articles.

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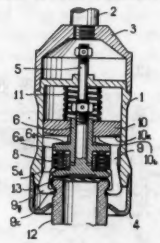
**3,672,121**
**CONTAINER SEALING DEVICE**

**Kohachi Kawaminani, 35, 1-chome, Noehigashinocho, Jotoku, Osaka, Japan**

**Filed Dec. 9, 1970, Ser. No. 96,307**
**Int. Cl. B65b** *7/28*
**U.S. Cl. 53—351** **3 Claims**



A head unit to seal bottles and other similar containers with ductile metallic caps, having a central spindle with lower face plate and also a chuck with radially spaced fingers and jaws to be opened normally and closed when a bottle neck raises both the spindle and the chuck in a manner that the spindle is raised more than the chuck by the cushioning effect of springs, so that the chuck jaws may press and deform the metallic cap to the bottle neck in a tightly fitting relation as they slide along the bottle neck.

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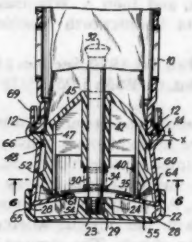
**3,672,122**
**BAG HOLDER AND EXPANDER UNIT**

**Leonard Berger, Ridgewood; William E. Fitzpatrick, Oakland, both of N.J.; James H. McGinley, Smyrna, Del.; Adolf Pfund, Milford, N.J., and Ira G. Schwartzberg, Dover, Del., assignors to International Playtex Corporation, New York, N.Y.**

**Filed July 20, 1970, Ser. No. 56,364**
**Int. Cl. B31b** *7/00;* **B65b** *43/26*
**U.S. Cl. 53—384** **12 Claims**



A bag expander is provided for mounting an open ended flexible bag positioned thereon on to a hollow, reusable holder

which terminates in an annular edge. The expander has a base member and a head member which are adapted to move axially with respect to each other. A plurality of fingers are housed in the base member and biased toward the head member such that the head member provides a camming action on the fingers when axial movement takes place. A bag is placed over the head member and ends of the fingers of the expander, which is positioned on the holder and depressed, thereby camming the fingers outwardly and thus folding the bag outwardly and over the edge of the holder. Excursion limitation means are provided to limit the relative movement between the head member and base member of the expander to prevent the fingers from contacting the bag at the edge of the holder during the bag seating operation to prevent tearing of the bag, especially if the expander is rotated during the seating operation. In a preferred embodiment the excursion limitation means is comprised of a skirt extension of the head member which is of a predetermined length and prevents further movement when the skirt reaches the base member. The skirt is preferably of such a configuration so as to perform the additional function of supporting the fingers on their initial movement. An improved base construction is provided having compartments which seat the fingers for pivotal movement therein, as well as preventing lateral movement of the fingers, which simplifies the fabrication of the expander.

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**3,672,123**

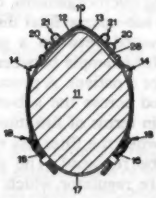
**TROTTING-HORSE SADDLES**

**Albert W. Dykman, No. 2 R.D., Ashburton, New Zealand**

**Filed June 22, 1970, Ser. No. 48,314**

**Int. Cl. B68b** *01/00*

**U.S. Cl. 54—2** **2 Claims**



A saddle for a trotting-horse comprises two superimposed straps secured together, the upper strap being separated from the lower strap at two points so as to form two D-shaped openings disposed one on each side of the horse, and adapted to receive the shafts of a sulky pulled by the horse.

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**3,672,124**

**HARNESS FOR ATTACHING A HORSE TO A VEHICLE**

**Angelo Pirotta, Settimo Milanese, Italy, assignor to Racing Tack di Angelo Pirotta & C.S.a.s., Milan, Italy**

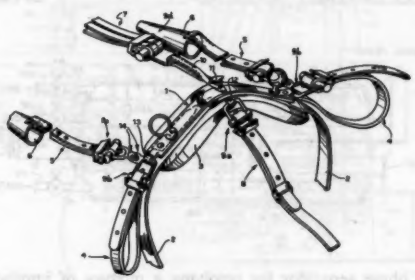
**Filed Nov. 5, 1970, Ser. No. 87,136**

**Claims priority, application Italy, Nov. 29, 1969, 54216 A/69**

**Int. Cl. A68b** *05/00*

**U.S. Cl. 54—38** **2 Claims**

A lightweight harness for a sulky comprises a central element worn on the horse's back, and a plurality or straps connected to the element by buckles. The strap is laminated from leather and plastics material. The buckle comprises a slotted body with wings defining a wedge-shaped space along the slot, and a guide bracket having two parallel limbs and a cross-piece. A slide member is mounted on the guide limbs and has a wedge-shaped part that enters the wedge-shaped cavity and



locks in place a strap that is threaded through the slot, over the slide member, and returns through the slot.

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**3,672,125**

**NTA SOLID SUPPORT FOR HYDROGEN SULFIDE REMOVAL**

**Richard C. Miller, Chicago, Ill., assignor to Nalco Chemical Company, Chicago, Ill.**

**Filed Jan. 28, 1971, Ser. No. 110,611**

**Int. Cl. B01d** *53/34*

**U.S. Cl. 55—73** **5 Claims**

A method of removing hydrogen sulfide from gaseous streams by means of a nitrilotriacetic acid-ferric complex sorbed on a silica-alumina support.

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**3,672,126**

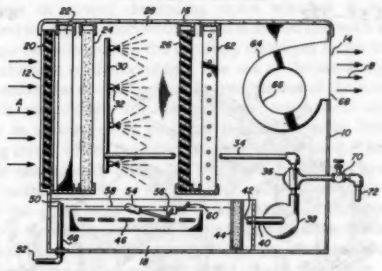
**AIR CONDITIONER**

**William H. Goettle, Scottsdale, Ariz., assignor to Goettle Bros. Metal Products, Inc.**

**Filed July 20, 1970, Ser. No. 56,531**

**Int. Cl. B03c** *3/66*

**U.S. Cl. 55—106** **8 Claims**

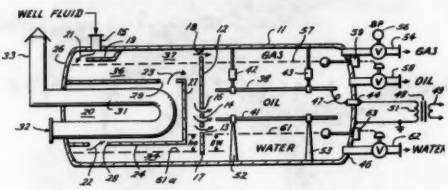


An air cleaner having a plurality of spaced apart filters including an electronic filter, as well as other filters and a spray chamber disposed between some of said filters and having spray nozzles adapted to emit cool liquid in a flow path of air through said filters; and refrigeration means for cooling said liquid so as to cool said air to a degree at which a dew point condition exists such that liquid sprayed into the air will collect moisture from the air, thereby drying and also cooling it.

## 3,672,127
## PHASE SEPARATOR FOR IMMISCIBLE FLUIDS

Weldon D. Mayse, and Frederick D. Watson, both of Houston, Tex., assignors to Petrolite Corporation, St. Louis, Mo.

Filed May 26, 1970, Ser. No. 40,624
Int. Cl. B01d 19/00
U.S. Cl. 55—174 28 Claims

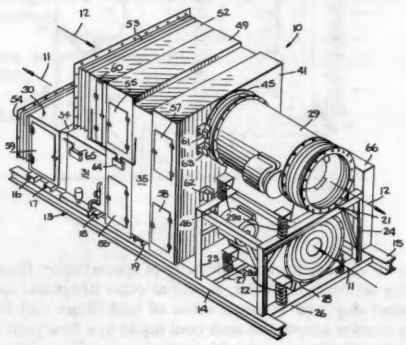



A phase separator for resolving a mixture of immiscible fluids such as crude oil and water phases. The separator comprises a vessel with an inlet, oil and water outlets and divided by a baffle into inlet and outlet separation zones. A metering orifice in the baffle discharges all oil from the inlet separating zone into the outlet separation zone responsively to a substantial pressure differential whose magnitude is automatically determined by the rate of crude oil inflow into the vessel. A large opening in the baffle provides for unobstructive flow of the water between the separation zones in a lower horizon of the vessel. A heater in the inlet separation zone promotes an initial separation into oil and water phases. Water is removed at the lower horizon in the vessel to maintain the oil-water interfacial zone at a relative fixed level. An electric field between electrodes in the outlet separation zone promotes further separation of the liquids in the outlet separation zone. A second large opening in the baffle at the upper horizon allows gas to pass freely between separations zones for removal through a back-pressure valve. The total open area of the orifice is selected so that the oil-water interfacial zone remains below the upper horizon in the outlet separation zone and above the lower horizon in the vessel under all normal rates of flow of incoming liquids through the inlet.

## 3,672,128
## UNITIZED AIR TREATING UNIT

Donald B. Heffron, Townsend, Tenn., assignor to Aero-Flow Dynamics, Inc., The Wing Company Division, Linden, N.J.

Filed July 23, 1970, Ser. No. 57,508
Int. Cl. B01d 27/08
U.S. Cl. 55—222 6 Claims

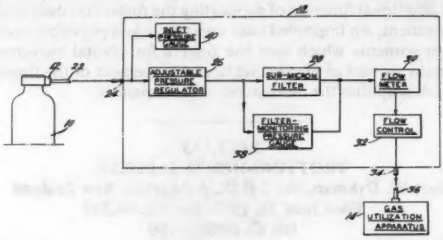


Two air moving devices are mounted one above the other on a frame platform integrated with an enthalpy wheel, interconnecting box-like duct structures, air filters, and a sprayed coil conditioning unit. The arrangement has two substantially independent straight line parallel and co-planar paths for the passage of air, one path for supply and the other for exhaust. In a modification the conditioning unit and high efficiency air filter are omitted.

## 3,672,129
## APPARATUS FOR DISPENSING STERILE GAS

Gordon N. Strople, Cherry Hill, and Justin W. Mills, Jr., Cinnaminson, both of N.J., assignors to Lif-O-Gen, Inc., Lumberton, N.J.

Filed March 20, 1970, Ser. No. 21,242
Int. Cl. B01d 53/30
U.S. Cl. 55—270 6 Claims




A portable unit for sterilizing gas to cleanse it of foreign bodies, especially living microorganisms, comprising a portable frame supporting a sub-micron filter through which the gas is passed when connected between a gas source and gas utilization apparatus, for example between an oxygen source and an oxygen mask for a patient. A pressure gauge monitors the pressure developed across the sub-micron filter and is preferably calibrated in terms of filtration efficiency to provide an indication of when the filter has reached a condition for which it should be replaced. The sub-micron filter is preceded by a pressure regulator which receives gas under high pressure from a contaminated source, reduces it to a working pressure, and supplies it to the sub-micron filter at a fixed predetermined pressure value. Preferably also employed are an inlet pressure gauge for measuring the pressure of the gas supplied from the source to the pressure regulator and a flow meter and flow control through which the gas passes before it is delivered to the outlet connection to the gas utilization apparatus. In this way gas from a bulk source or an unsterilized container is rendered sterile by connection thereto of the portable gas sterilizer. The visual monitoring of the condition of the filter insures proper maintenance by replacement of the filter when needed.

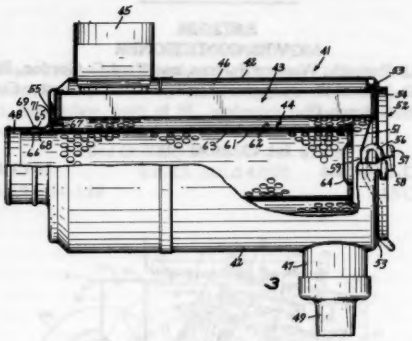
## 3,672,130
## RETENTION MEANS FOR AIR CLEANER ELEMENT

Bruce M. Sullivan, Burnsville, and Carl M. Kaus, Bloomington, both of Mich., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed April 2, 1970, Ser. No. 25,092
Int. Cl. B01d 59/50
U.S. Cl. 55—323 5 Claims

The disclosure is directed to a centrifugal air cleaner which includes within an outer container a primary filter assembly and a secondary backup filter assembly, both of which are removably disposed for purposes of maintenance and replacement. The primary filter assembly is sealably held between the ends of the container. The secondary assembly is disposed

within the primary assembly, but is independently supported at the filtered fluid outlet by a plurality of beaded spring clips which cooperate with an annular recess located on the inner wall of the outlet.



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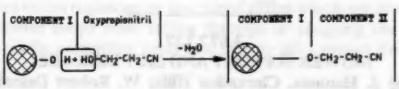
**3,672,131**
**STATIONARY PHASE FOR SELECTIVE SORPTION**
**Istvan Halasz, Frankfurt am Main, Germany**
**Filed Jan. 15, 1970, Ser. No. 3,054**
**Int. Cl. B01d *15/08***
**U.S. Cl. 55—386** **16 Claims**




Stationary phases for chromatographic ion exchange or catalysis produced by esterification of solid substances having acidic OH groups at the surface as Components I with organic compounds as Components II. The specific surface area of Components I is above 100 $cm^2/g$ and Components II each have at least one hetero atom in their molecules, disregarding the oxygen connected to a carbon atom in the molecule for esterification with the acid OH group in Component I. By hetero-atoms is meant an atom other than carbon and hydrogen.

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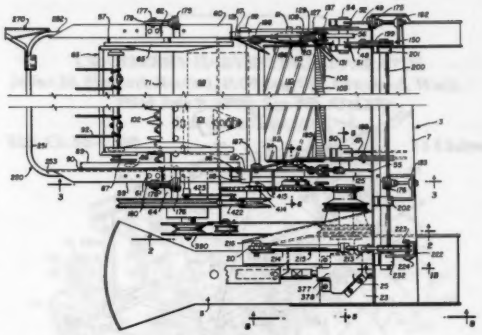
**3,672,132**
**PUSH OVER BAR**
**Thomas J. Scarnato, Barrington, and N. Donald Patterson, Downers Grove, both of Ill., assignors to International Harvester Company, Chicago, Ill.**
**Filed Feb. 5, 1970, Ser. No. 9,020**
**Int. Cl. A01d *47/00***
**U.S. Cl. 56—1** **9 Claims**

A push over bar attachment for a crop harvester. The attachment comprises a U-shaped member having a pair of laterally spaced side legs and an intervening cross-bar. A novel bracket attachment for each leg to an adjacent side panel of the harvester. Each bracket has a pair of identical generally Z-shaped elements clamping the associate side leg therebetween, a pair of bolts secure the brackets along one edge to each other and along an opposite edge there extend a pair of bolt and nut assemblies one of which is attached to an adjacent side panel of the harvester and provides a horizontal pivot to permit the attachment to swing vertically to adjusted positions and the other extends through an arcuate slot concentric with the axis of pivot and secures the bracket to the side panel to hold the attachment in selected adjusted positions.



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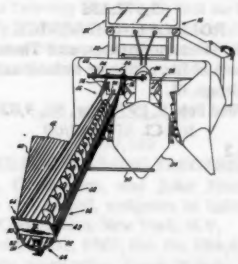
**3,672,133**
**CONVEYOR ATTACHMENT FOR A COMBINE**
**Herbert K. Mestad, R.R. 1, Clear Lake, Iowa**
**Filed Oct. 14, 1970, Ser. No. 80,606**
**Int. Cl. A01d *61/04***
**U.S. Cl. 56—13.5** **13 Claims**



An easily mountable and demountable auxiliary conveyor attachment for use with a combine whereby the combine can be driven or towed depending upon whether it is self-propelled to any location where grain is stored and such stored grain can be delivered by the auxiliary conveyor to the threshing mechanism of the combine. The use of the auxiliary conveyor makes the normal operating mechanism of the combine available particularly for shelling corn when such corn is located in a storage bin or other location remote from the growing crops where the combine is normally used. The conveyor is usable with either the corn head or grain head attached to the combine or may be used with the combine when neither the grain head or corn head is attached thereto. The conveyor is provided with a quick coupling attachment for operation to power sources available on the combine and may also be provided with a self-contained source of power.

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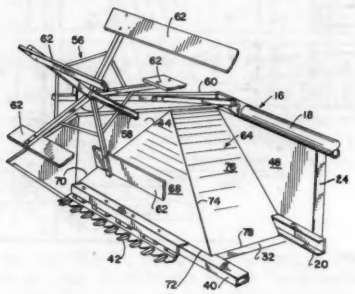
**3,672,134**
**CROP HARVESTER PLATFORM**
**Donald A. McCallum, Burlington, Ontario, Canada, assignor to International Harvester Company, Chicago, Ill.**
**Filed May 26, 1971, Ser. No. 147,109**
**Int. Cl. A01d *47/00***
**U.S. Cl. 56—14.4** **5 Claims**

A crop harvester having a self-propelled chassis and a crop harvester platform supported forwardly of said chassis for

cutting a standing crop and depositing the cut crop into a swath on the ground. The harvester platform includes a cutter, a crop-gathering reel above the cutter, and a pair of gauge wheels behind the cutter for supporting the platform for



movement over the ground. A pair of shield structures is mounted on the platform over the respective gauge wheels. The shield structures are arranged to direct the flow of cut crop rearwardly and laterally inwardly of the platform to form the swath.

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**3,672,135**

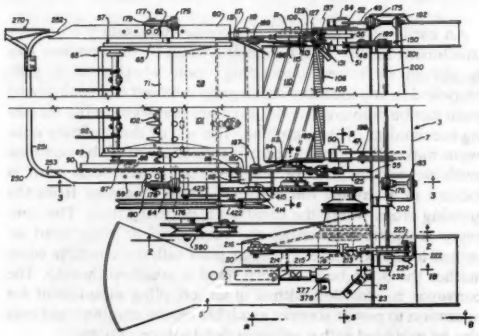
**ROLL OPENING DEVICE**

**Peter J. Peacock, Western Springs, and Thomas J. Scarnato, Barrington, both of Ill., assignors to International Harvester Company, Chicago, Ill.**

**Filed Feb. 5, 1970, Ser. No. 9,026**

**Int. Cl. A01d *43/00***

**U.S. Cl. 56—14.2** **1 Claim**



A mower conditioner having a pair of hay conditioning rollers. A pair of levers mounting the upper roller intermediate their end, having forward ends pivoted coaxially to the sides of a harvesting unit vertically, swingably mounted from a ground supported frame, and links pivoted coaxially at their upper forward ends to the rear ends of the levers and having lost-motion connections at their rear ends to the stationary framework supporting the unit, the links functioning as compression members beyond the extent of lost-motion and operative to swing the roller mounting levers upwardly attendant to the harvesting unit being pivoted upwardly beyond a predetermined elevation.

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**3,672,136**

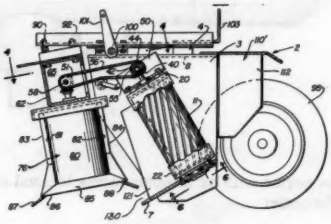
**MOWER CONDITIONER**

**Peter J. Peacock, Western Springs, and Paul C. Gordon, Hinsdale, both of Ill., assignors to International Harvester Company, Chicago, Ill.**

**Filed Sept. 21, 1970, Ser. No. 73,923**

**Int. Cl. A01d *49/00***

**U.S. Cl. 56—14.4** **10 Claims**



A mower conditioner having rotary cutters arranged in pairs, each pair cutting the crops in front thereof and throwing the cut crops rearwardly to a pair of short length, vertically inclined, crushing rollers which in turn discharge the crops against the underside of a deflector by which the crops are fluffed and deposited upon the field.

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**3,672,137**

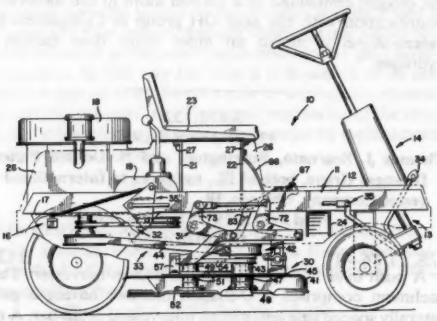
**MOWER SUPPORT AND LIFT LINKAGE**

**George J. Hamouz, Clarendon Hills; W. Robert Dalenberg, Hinsdale, and James W. Zurek, Berkeley, all of Ill., assignors to International Harvester Company, Chicago, Ill.**

**Continuation of Ser. No. 725,725, May 1, 1968, abandoned. This application Oct. 26, 1970, Ser. No. 84,256**

**Int. Cl. A01d *35/26***

**U.S. Cl. 56—15.8** **1 Claim**



A mounting assembly for adjustably supporting an implement from a riding lawn mower, the assembly comprising a parallel lift linkage mounted on the mower, a cutting unit suspended from the linkage, and a lever operatively connected

to the linkage for varying the elevation of the cutting unit. The lift geometry of the lever relative the operator is such to provide a three-point force distribution opposing the lift force exerted on the lever.

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**3,672,138**

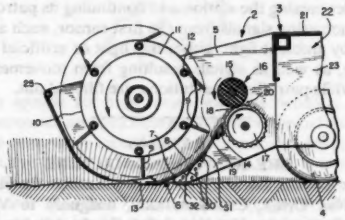
## FORAGE HARVESTER

**Thomas J. Scarnato, Barrington, Ill.; Guy O. Tufts, Phoenix, Ariz.; Peter J. Peacock, Western Springs, and George B. Cicci, Broadview, both of Ill., assignors to International Harvester Company, Chicago, Ill.**

**Filed Oct. 16, 1970, Ser. No. 81,359**

**Int. Cl. A01d *43/02***

**U.S. Cl. 56—158** **13 Claims**



A forage harvester having an upwardly and rearwardly inclined platform and a reel sweeping over the platform to move the crops from a cutter at the front edge of the platform to associated mechanism at the rear of the platform. The platform is provided with a plurality of apertures in the form of louvers or corrugations or apertured riffles which are arranged to prevent crops from falling through or plugging the apertures while permitting sand and dirt to sift through the platform.

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**3,672,139**

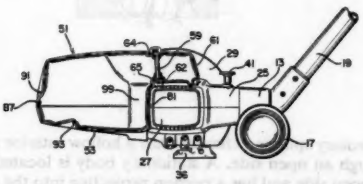
## TRIMMER-EDGER DEBRIS CATCHER

**Raymond J. Duran, Lutherville, and Gordon F. Musch, Fork, both of Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.**

**Filed July 14, 1971, Ser. No. 162,581**

**Int. Cl. A01d *35/22***

**U.S. Cl. 56—202** **11 Claims**



A trimmer-edger including a frame supported for movement along the ground. A motor and motor housing are supported upon the frame and the motor has an output rotary shaft to which a blade is affixed. The motor housing is pivotally adjustable upon the frame so that the blade can rotate through a generally horizontal or a generally vertical plane for trimming and edging, respectively. An upstanding handle is secured to the frame for control and manipulation of the device. A novel debris catcher is releasably secured to the housing forwardly of the blade and is adapted to receive grass, debris, etc., propelled forwardly by the blade during use of the device as an edger.

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**3,672,140**

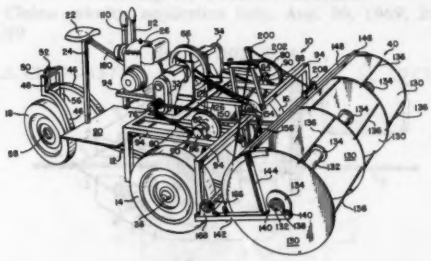
## CRANBERRY HARVESTING APPARATUS

**Julius M. Furford, Route 1, P.O. Box 442, Grayland, Wash.**

**Filed July 9, 1970, Ser. No. 53,425**

**Int. Cl. A01d *45/08***

**U.S. Cl. 56—330** **11 Claims**



A self-propelled vehicle having a pair of driven front wheels and a single free rotating pivotal rear wheel mounted on a generally triangular chassis. A motor mounted on the chassis adapted to drive the front wheels and a cranberry harvesting reel mounted on the front portion of the chassis. Separate drive trains running from the motor to each wheel, each drive train including a two-way clutch such that each wheel may be driven forwardly, rearwardly or completely disengaged from the motor for free rotation. An operator's platform mounted on the chassis adjacent control means for the two-way clutches.

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**3,672,141**

## APPARATUS FOR FORMING ELECTRIC CABLES

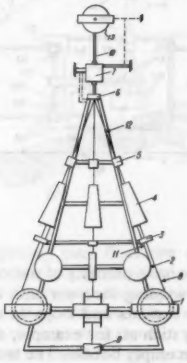
**Alojzy Tomica, Goodmayes, and John Francis Blackwell, Welling, both of England, assignors to International Standard Electric Corporation, New York, N.Y.**

**Filed Dec. 31, 1969, Ser. No. 889,454**

**Claims priority, application Great Britain, Jan. 2, 1969, 218/69**

**Int. Cl. D02g *3/36*; B65h *81/00***

**U.S. Cl. 57—12** **12 Claims**



A pair of conductors are insulated and twisted together in a continuous operation. Each conductor passes through in-

dividual forming means which simultaneously apply insulation to each conductor and means are provided to twist the insulated conductors together.

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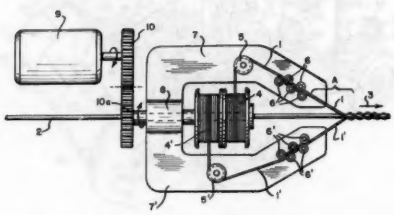
**3,672,142**
**WINDING APPARATUS AND METHOD**
**William J. Gilmore, Manitou Beach, Mich., assignor to American Chain & Cable Company, Inc., New York, N.Y.**
**Filed March 27, 1970, Ser. No. 23,432**
**Int. Cl. D07b 3/04**
**U.S. Cl. 57—17** **11 Claims**



Method and apparatus are disclosed for producing a composite multiwire structure by helically wrapping at least one wire structure about a core element and, prior thereto, imparting undulating longitudinal movement to the wire structure at a point located closely to the point of wrapping to effectively control torsion naturally induced in the wire structure during the wrapping operation.

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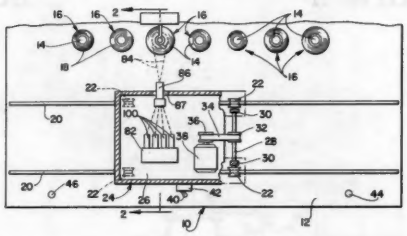
**3,672,143**
**DOFFING APPARATUS AND METHOD**
**William R. Whitney, Cranston, R.I., assignor to Leesona Corporation, Warwick, R.I.**
**Filed Oct. 20, 1970, Ser. No. 82,455**
**Int. Cl. D01h 9/10**
**U.S. Cl. 57—53** **17 Claims**



A spinning frame has a plurality of stations for spinning roving into yarn and winding the yarn onto a bobbin. A tender moves passed the stations and stops at any of the stations requiring servicing such as, for example, doffing a filled bobbin and donning an empty bobbin. The tender then continues patrolling the stations until it comes upon another station requiring servicing. As the tender patrols the stations, a first sensing device on the tender scans the stations to determine whether or not the yarn is advancing normally and provides an appropriate signal. A signal from a second sensing device indicates whether or not the station is operational. The signal from the first sensing device is combined with the signal from the second sensing device to stop the tender only at an operational station requiring servicing, whereupon the servicing cycle commences. At the end of servicing, if the yarn is advancing normally the tender resumes its patrolling. If the yarn is not advancing properly, another servicing cycle is commenced. Thereafter, if the yarn is still not advancing properly, the roving is automatically broken above the usual drafting rolls of the station as a signal flag is positioned to indicate to the second sensing device that the particular station is non-operational. The tender is not stopped at a non-operational station. The two sensors may both be phototransducers. The first sensor provides a particular fluctuating signal responsive to a transverse alternating motion of the yarn which results from ballooning of the yarn as it is advanced longitudinally while being wound onto the bobbin, and this signal results in the tender passing the station and continuing its patrolling. All other fluctuating signals from the first sensor, such as may be caused by ambient light, either day light or artificial light, for example, as well as signals resulting from movement of the tender while patrolling the stations, are filtered out.

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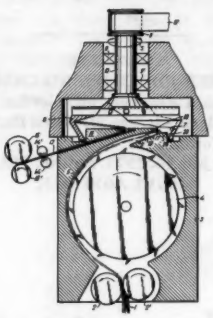
**3,672,144**
**BREAK-SPINNING MACHINE**
**Stanislav Didek; Zdenek Svec, and Frantisek Pospisil, all of Usti Nad Orlici, Czechoslovakia, assignors to Vyzkumny Ustav Bavlnarsky, Usti Nad Orlici, Czechoslovakia**
**Filed April 30, 1971, Ser. No. 138,954**
**Claims priority, application Czechoslovakia, May 6, 1970, 3141/70**
**Int. Cl. D01h 1/12**
**U.S. Cl. 57—58.95** **11 Claims**

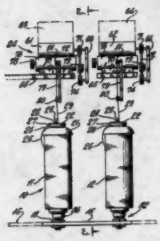


A rotary spinning chamber has a hollow interior accessible through an open side. A stationary body is located adjacent the open side and has a portion projecting into the same, this portion being either cylindrical or frustoconical in outline and having a transverse surface extending transversely of the axis of rotation of the spinning chamber and a circumferential surface which surrounds this axis. A fiber channel is formed in the stationary body having an upper and a lower boundary surface, an inlet receiving fibers from a fiber feed means and an outlet provided in the projecting portion. The outlet is so located in the projecting portion that the upper and the lower boundary surfaces of the fiber feed channel respectively intersect the transverse and the circumferential surface of the projecting portion.

## 3,672,145
## SUPPLY SPINDLE FOR TWISTING MACHINE

Josef Pfenningsberg, Monchengladbach, Germany, assignor to U.S. Textile Machine Company, Scranton, Pa.

Filed Nov. 16, 1970, Ser. No. 89,959
Int. Cl. D01h 7/02
U.S. Cl. 57—60 17 Claims

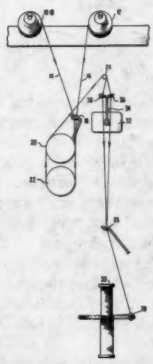


Supply spindle for high speed upstroke twisting. A blade, which surrounds an upstanding, stationary core of the spindle, has a cap removably mounted on its upper end, for rapid rotation with the blade. A filament-twisting rotor is mounted on the cap, for rotation therewith and for filament-twisting motion relative thereto. The supply package of filament is mounted on the blade, below the cap, and filament is unwound from this package. A short length of the unwound filament always runs to and over the cap, and to an upper central part of the twisting rotor, for the application of twist and for guidance to an overlying collector spindle. The filament is kept under extremely low tension, and this tension is kept substantially uniform. For these purposes the core and blade are constructed so as to avoid vibratory criticality at normal high-speed rotation of the spindle, and rapidly to dampen vibrations of the core, blade and supply package while the rotational speed rises to or falls from the normal speed, which typically amounts to multiples of 10,000 rpm.

## 3,672,146
## YARN BREAK DETECTOR

Cecil S. Adams, Greenville, S.C., assignor to Adams Incorporated, Greenville, S.C.

Filed Oct. 28, 1970, Ser. No. 84,830
Int. Cl. D01h 13/16
U.S. Cl. 57—81 5 Claims

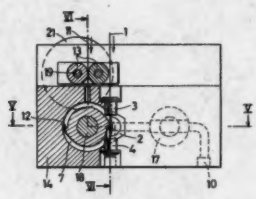


A yarn break detector is disclosed particularly for twisting machines used for plying two or more yarns. The arrangement includes a switch operated by a drop wire means which is positioned between the feed mechanism and the twisting and take-up means and holds the two yarns separated from each other in such manner that breakage of either or both yarns change the condition of the switch. A switch which is particularly adaptable to this environment is also disclosed.

## 3,672,147
## METHOD FOR MANUFACTURING YARN CONSISTING OF FIBERS AND FILAMENTS

Michele Calleri; Giorgio Faraci, both of Gozzano, and Mario Paracchini, Borgomanero, all of Italy, assignors to Bemberg S.p.A., Milan, Italy

Filed Aug. 19, 1970, Ser. No. 65,006
Claims priority, application Italy, Aug. 30, 1969, 21470 A/69
Int. Cl. D02g 3/34
U.S. Cl. 57—157 F 7 Claims

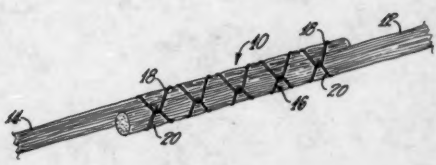


A method and an apparatus for producing a yarn composed by a bundle of filaments with which fibers or staples are interlaced which are blown in the desired quantity by means of a jet of air or gas by a metering device and thereafter are conveyed by the jet on the bundle of filaments in an interlacing device. Preferably a part of the jet of air or gas is guided through the metering device and cooperates with the same, and this part of the jet is combined with another part of the jet passing outside the metering device before the interlacing device or within the same. The jet of air or gas guided through the metering device may be intermittent and also the feeding of staples or fibers to the jet of air or gas by the metering device may be intermittent.

## 3,672,148
## SEWN TIRE CORD SPLICE AND METHOD

Gustav E. Benson, Edgewood, and James M. Pisani, Cumberland, both of R.I., assignors to Owens-Corning Fiberglas Corporation

Filed April 27, 1970, Ser. No. 31,896
Int. Cl. B65h 69/06
U.S. Cl. 57—159 4 Claims



A method of splicing glass fiber tire cord ends together which includes the steps of positioning oppositely extending tire cord ends in side-by-side overlapping relationship and sewing an extensible thread around the overlapping ends using a zigzag stitch, the sewing being done in such a manner as to preclude penetration of the overlapping cord ends by the needle, and the sewing tension on the thread causing it to elongate as it is being applied. Excess thread is then trimmed off. Subsequent retraction of the thread after it is locked in position around the overlapping cord ends causes it to form a very tight

wrap around the tire cord ends. Also disclosed is the splice or joint made by such method. The splice includes oppositely extending glass fiber tire cord ends in side-by-side overlapping relationship bound together with an extensible thread having been sewn in a zigzag stitch.

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**3,672,149**

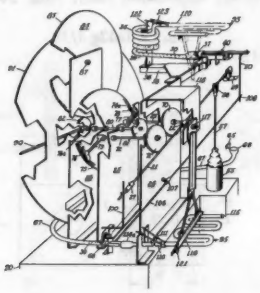
**CLOCK MECHANISM ACTUATED BY SUCCESSIVELY SUPPLIED BALL WEIGHTS**

**Lawrence A. Howard, 737 Pierce Avenue, Columbus, Ohio**

**Filed Nov. 23, 1970, Ser. No. 92,011**

**Int. Cl. G04b *45/00***

**U.S. Cl. 58—2** **10 Claims**



A clock mechanism actuated by a large number of separate ball weights which are fed individually from a supply chamber into a cup on a counterweighted pivoted motion arm or balance lever. The weight of each successive ball overcomes the counterweight of the lever and swings it about its pivot until the ball cup moves to a position where the ball drops from the cup and permits the lever to swing back to its counterbalanced position. The lever is connected to suitable mechanism so that this movement of the lever produces a predetermined advance of indicators of the clock to indicate correct time. The balls discharged successively from the ball cup are collected and supplied to the ball supply chamber for re-use in actuating the indicator mechanism.

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**3,672,150**

**DISPLAY DIAL ASSEMBLY FOR TIMEPIECE**

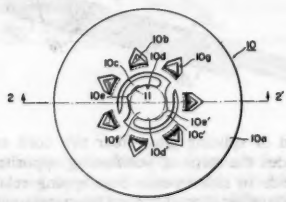
**Tetuya Yasuda; Hidetaka Tutiya, and Takeshi Mori, all of Tokyo, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan**

**Filed Dec. 28, 1970, Ser. No. 101,668**

**Claims priority, application Japan, Dec. 25, 1969, 44/104545; June 30, 1970, 45/65151; Nov. 12, 1970, 45/111594**

**Int. Cl. G04b *19/24***

**U.S. Cl. 58—5** **7 Claims**




The present invention relates to a display dial, such as a day calendar display dial, for a timepiece.

The improvement comprises the provision of at least two resilient arms made integral therewith and adapted for easy and positive engagement with a positioning peripheral groove formed on the mounting shaft for the dial.

**3,672,151**

**SYNCHRONOUS ALARM CLOCK MECHANISM**

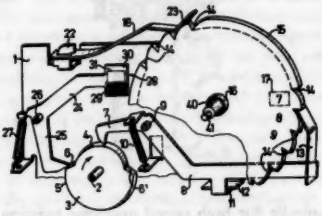
**Walter Trimpler, Nurnberg, Germany, assignor to Diehl, Nurnberg, Germany**

**Filed Jan. 11, 1971, Ser. No. 105,217**

**Claims priority, application Germany, Jan. 14, 1970, G 70 01 038.7**

**Int. Cl. G04b *19/24***

**U.S. Cl. 58—5** **9 Claims**



The specification discloses an arrangement for a clock, such as an electrical driven alarm clock. The clock is provided with indexable date indicating means and with day-night indicating means and with actuators in the form of levers for actuating the said means. The clock includes a shaft rotatable once every 24 hours and this shaft carries a single cam disc with a single cam track thereon and both of the aforementioned levers engage the cam track and are actuated thereby.

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**3,672,152**

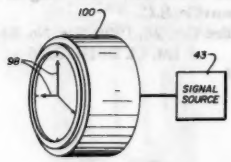
**ELECTROMECHANICAL OSCILLATOR**

**William E. Reefman, Santa Barbara, Calif., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.**

**Filed June 17, 1970, Ser. No. 46,926**

**Int. Cl. G04c *3/02*; H02k *7/06***

**U.S. Cl. 58—23 V** **10 Claims**




A ring-shaped pendulum is supported on a base by crossed flat spring flexure members which permit limited rotational movement of the pendulum. Each flexure member is supported at one end by the base and is connected to the pendulum at the opposite end. Piezoelectric elements, either laminated to flexure members or coupled to them by drive rods, cause oscillation of the pendulum upon application to the elements of an electrical signal at a frequency approximately the same as the natural frequency of the suspended system or in multiple relation thereto. Through a spring-pressed pawl attached to the pendulum, the oscillating movement of the latter actuates a ratchet wheel, which drives a gear train.

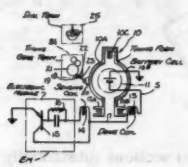
A variant form is self-energized. A piezoelectric element on one flexure member provides an input signal to an amplifier. The output from the amplifier is used to drive a piezoelectric element on another flexure member, thus maintaining the suspended system in oscillation.

3,672,153

## MINIATURIZED BATTERY-OPERATED TUNING-FORK TIMEPIECE

William W. Mutter, Paramus, N.J., assignor to Bulova Watch Company, Inc., New York, N.Y.

Filed Aug. 3, 1970, Ser. No. 60,271
Int. Cl. G04c 3/00
U.S. Cl. 58—23 TF 5 Claims



A miniaturized electronic watch including a tuning-fork resonator which is sustained in vibration by a battery-energized electronic drive circuit and whose vibrations are converted into rotary motion for operating dial pointers. The tuning fork, which is mounted on a pillar plate, is constituted by a pair of tines having a bow-legged formation to define a circular zone. The battery for the electronic drive circuit is seated in the zone within a circular well formed in the pillar plate, thereby conserving space.

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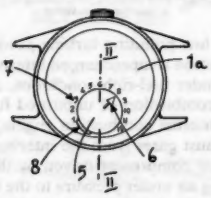
3,672,154

## ELECTRIC TIME-PIECE

Kurt Hubner, Neuchatel, Switzerland, assignor to Ebauches Electroniques S.A., Neuchatel, Switzerland

Filed July 28, 1971, Ser. No. 166,761
Claims priority, application Switzerland, Aug. 7, 1970, 11906/70
Int. Cl. G04c 3/00; G04b 37/12
U.S. Cl. 58—23 BA 4 Claims



A time-piece the case of which contains a source of current in the form of an ordinary or storage-battery housed in a space closed by means of a plug, characterized by the fact that one of the two elements, casing and plug, is provided with a scale and the other one with a mark, so that when the plug is put in place, it can be adjusted to such an angular position that the mark indicates, at least approximately, with respect to said scale, the date at which the source of current has been put in place or the date at which this source must be replaced.

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3,672,155

## SOLID STATE WATCH

John M. Bergey, and Richard S. Walton, both of Lancaster, Pa., assignors to Hamilton Watch Company, Lancaster, Pa.

Filed May 6, 1970, Ser. No. 35,196
Int. Cl. G04b 19/30
U.S. Cl. 58—50 R 17 Claims

Disclosed is a solid state watch which requires no moving parts for timekeeping and display. The watch comprises a crystal controlled oscillator connected through an integrated circuit binary frequency divider to an electro-optical display in the form of light emitting diodes. The display is energized only on demand and the level of the light output is controlled

in accordance with ambient light conditions. The watch is energized from a rechargeable battery.

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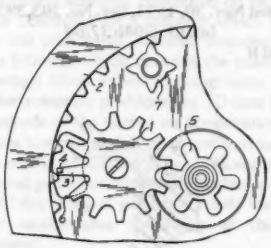
3,672,156

## BREAK PREVENTION DEVICE FOR CALENDAR ADVANCING OF A CALENDAR WATCH

Mamoru Miyasaka, Shimosuwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed June 4, 1971, Ser. No. 150,110
Claims priority, application Japan, June 11, 1970, 45/57055
Int. Cl. G04b 19/24
U.S. Cl. 58—58 5 Claims



A break prevention device for a calendar watch wherein the calendar advancing wheel includes an elongated adjusting tooth formed with a partial slope at its end and resiliently displaceable out of the plane of the calendar wheel.

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3,672,157

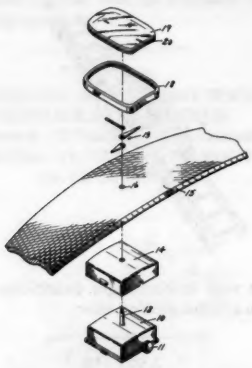
## COMBINED WATCH AND CONTINUOUS WATCH BAND

John Manceri, Long Island, N.Y., assignor to Judson Jewelry Corp., New York, N.Y.

Filed Nov. 15, 1971, Ser. No. 198,518
Int. Cl. G04b 37/00
U.S. Cl. 58—88 W 5 Claims

A wrist watch which comprises a substantially continuous watch band arranged so that a central portion of the band extends across the user's wrist and further serves as the dial or face of the watch. Soldered or otherwise secured to the underside of the band is the watch case including the watch movement and from which a center spindle supporting the hour and second hands extends through a small opening in the watch band so as to be positioned over said band central portion. A frame or bezel is soldered or otherwise secured to the opposite, upper side of the band above the watch movement. A crystal is supported by the bezel. As a result, the watch band become part of the watch itself, specifically its face. A standard size watch case movement can be used regardless of any form the watch frame or bezel will take. On the other hand, the frame or bezel may assume unlimited shapes and configu-

rations because it is used to delineate any desired portion of the band central portion. Thus the over-all construction of the



watch is simplified while unlimited aesthetic configurations are made possible.

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**3,672,158**

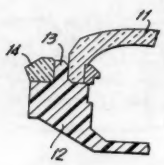
**SYNTHETIC RESIN WATCHCASE WITH EMBEDDED METAL REINFORCEMENT**

**Yoshiaki Fujimori, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan**

**Filed Nov. 30, 1971, Ser. No. 203,393**

**Int. Cl. G04b *37/08***

**U.S. Cl. 58—90 R** **3 Claims**



In a watchcase wherein the case-body is made of a synthetic resin, a long-lasting water-proof seal between the synthetic resin case and the glass face is ensured by means of a metal reinforcing ring embedded in the synthetic resin. The reinforcing ring is suitably perforated so that synthetic resin flows into the perforations during the molding operation and locks the reinforcing ring in place permanently.

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**3,672,159**

**APPARATUS FOR CRANE JIBS ADAPTED TO BE EXTENDED AND RETRACTED TELESCOPICALLY**

**Anders Erik Sundin, Forsa, Sweden, assignor to A. E. Sundin Produkter AB, Delsbo, Sweden**

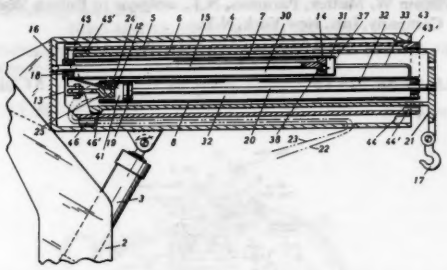
**Filed Feb. 25, 1970, Ser. No. 13,991**

**Claims priority, application Sweden, Feb. 28, 1969, 2764/69**

**Int. Cl. F15b *11/16, 13/06*; B66c *23/56***

**U.S. Cl. 60—10.5** **3 Claims**

A crane jib for attachment to a crane column including in combination a jib inner section pivotally attached to the crane column, a jib central section telescopically disposed with respect to the inner section, a jib outer section telescopically disposed with respect to the central section, first and second hydraulic cylinders disposed within the central section and having their rods attached respectively to the inner and outer sections, valve means and control means for applying fluid pressure through the valve means to the hydraulic cylinders



for telescoping said sections substantially simultaneously for extension and retraction of the jib.

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**3,672,160**

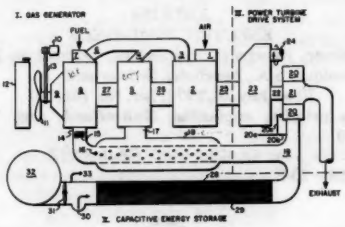
**SYSTEM FOR PRODUCING SUBSTANTIALLY POLLUTION-FREE HOT GAS UNDER PRESSURE FOR USE IN A PRIME MOVER**

**Dae Sik Kim, 23 Hearthstone Drive, Medfield, Mass.**

**Filed May 20, 1971, Ser. No. 145,128**

**Int. Cl. F02b *37/02***

**U.S. Cl. 60—13** **16 Claims**




An extremely low polluting turbine-powered vehicle comprises in combination a supercharged internal combustion engine operating under fuel-rich conditions, an interburner for completing the combustion of unburned fuel in the exhaust gases from the internal combustion engine, a gas turbine for utilizing the exhaust gases from the interburner for powering the vehicle, an air compressor driven by the engine and turbine for providing air under pressure to the interburner, an air compressor driven by the engine and turbine for providing air under pressure for use by the internal combustion engine and by the interburner compressor, a gas reservoir for storing exhaust gas supplied from the interburner for later use in providing power to the turbine for the acceleration of the vehicle or initial operation thereof, and a heat exchange/storage device for abstracting heat from the exhaust gas supplied to the gas reservoir and for returning a substantial portion of this abstracted heat to the exhaust gas delivered from the gas reservoir to the gas turbine.

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**3,672,161**

**CONTROL SYSTEM FOR A STEPLESS HYDROSTATIC DRIVE**

**Alfred Krusche, Grossostheim, and Helmuth Rosslein, Lohr/M., both of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany**

**Filed Jan. 13, 1971, Ser. No. 106,095**

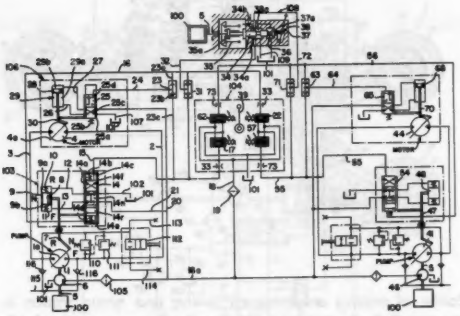
**Claims priority, application Germany, Jan. 15, 1970, P 20 01 701.0**

**Int. Cl. F02b *41/00***

**U.S. Cl. 60—19** **12 Claims**

A hydrostatic drive has a pump driven by a prime mover, e.g., an internal-combustion engine, and connected in a sub-

stantially closed hydraulic power circuit with a hydraulic motor connected to a load. The hydrostatic drive may be used, for example, to power a vehicle or an accessory or appliance of the vehicle. The hydrostatic pump-motor system has a control member shiftable to vary the speed of the system in a



stepless manner and operated by a servocylinder from a pilot valve which, in turn, is controlled by the pressure in a pair of pilot lines. A speed governor or sensor responsive to an overload of the engine, automatically acts upon the pilot valve to reduce the speed in the vent of a torque overload.

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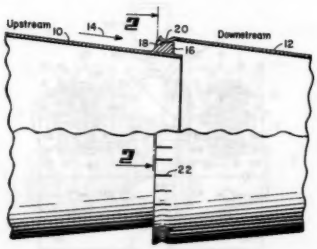
**3,672,162**

**COMBUSTION CHAMBER ASSEMBLY FOR A GAS TURBINE ENGINE**

**Joseph Rygelis, Monroe; Ervin J. Sweet, Trumbull, and Brian W. Doyle, Shelton, all of Conn., assignors to Avco Corporation, Stratford, Conn.**

**Filed Jan. 28, 1971, Ser. No. 110,449**
**Int. Cl. F02c *3/00***
**U.S. Cl. 60—39.32** **7 Claims**



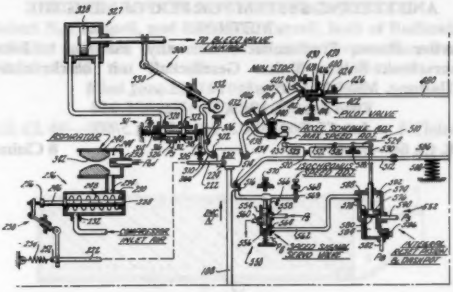

A combustion chamber liner is comprised of two telescoping sections, the leading edge of the downstream section overlapping the trailing edge of the upstream section. The end of the upstream section is provided with a plurality of peripherally spaced bosses. The outer peripheral surface of each of the bosses is grooved to accept the complementary depressed ring in the end of the larger downstream section. When cool, the dimensions of the upstream and downstream sections are such that there is a loose connection between the sections. However, the upstream section is heated more than the downstream section and causes its expansion to provide a tight fit.

**3,672,163**

**INTEGRAL FUEL CONTROL**

**Albert H. White, Wethersfield, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.**

**Filed Jan. 2, 1970, Ser. No. 230**
**Int. Cl. F02c *9/08***
**U.S. Cl. 60—39.28 R** **3 Claims**



A fuel control of the 3D cam type for a gas turbine engine has a proportional governor and an integral governor interconnected by a linkage which acts as a highest wins device between an acceleration schedule and the governors. The linkage also compares the actual engine speed with the desired set engine speed to position a pilot valve which controls the position of a fuel metering valve. An axially movable 3D cam has the acceleration schedule contoured on its surface and is adapted to be contacted by a follower which is functionally connected to the pilot valve. Another contour on the cam is engaged by a follower which controls the position of a compressor interstage bleed valve. A compressor air inlet temperature sensor rotatably positions the 3D cam in accordance with the magnitude of the sensed air temperature. The metering valve moves towards its full open position as the acceleration schedule on the advancing 3D cam closes the pilot valve. The proportional governor becomes effectual as the set speed is attained and the integral governor resets the proportional governor for isochronous governing at the preselected isochronous speed.

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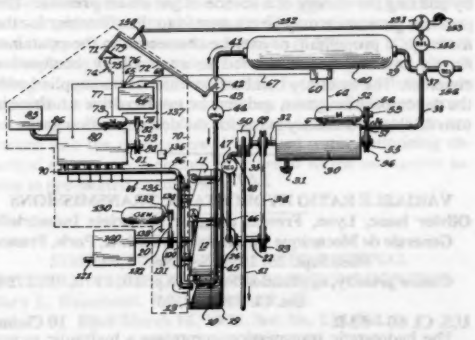
**3,672,164**

**INDEPENDENT IGNITION ENGINE**

**Don B. Pieper, Rolling Meadows, Ill., assignor to Whim, Inc.**

**Filed March 27, 1970, Ser. No. 23,368**
**Int. Cl. F02c *5/04***
**U.S. Cl. 60—39.38** **11 Claims**



Optimum or most economical air-fuel mixture for a turbine engine is maintained by having the fuel injection system, the ignition system and the pressure air system operate indepen-

dently of the rotational velocity of the drive shaft of the engine or any of its primary rotating parts. The engine turbine and its drive shaft may be decelerated by placing a high air compression load on the drive shaft.

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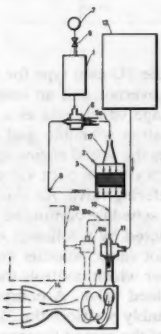
**3,672,165**

## METHOD OF FEEDING LIQUID PROPELLANTS TO GAS GENERATORS OR ROCKET COMBUSTION CHAMBERS AND FEEDING SYSTEM FOR PERFORMING THE METHOD

**Werner Baum, Frankenbach, Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Germany**

**Filed Sept. 3, 1969, Ser. No. 855,054**
**Int. Cl. F02k** *9/02, 9/06;* **F23k** *5/00*
**U.S. Cl. 60—39.48** **8 Claims**



A method of feeding liquid monergolic propellants, either alone or with liquid non-monergolic propellants, to gas generators or rocket combustion chambers, utilizes jet pumps, connected to propellant supplies, to feed the propellants. The monergolic propellants are catalytically dissociated to provide decomposition gases which are supplied to the jet pumps as the pump operating fluids to aspirate propellants into the jet pumps. The pressure drop across the catalysts is compensated by utilizing the energy of a source of gas under pressure. The pressure gas source may be connected to the container for the monergolic propellant, or may be connected to the container for an auxiliary propellant fed to an auxiliary combustion chamber. The auxiliary combustion chamber is supplied with the decomposition gases, and may be used to drive a turbine in turn driving an auxiliary pump for the decomposition gases.

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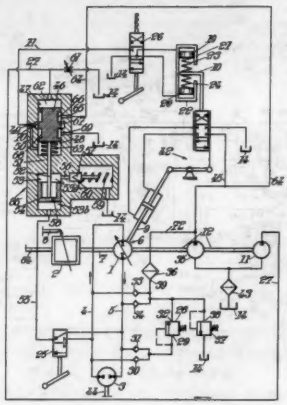
**3,672,166**

## VARIABLE RATIO HYDROSTATIC TRANSMISSIONS

**Olivier Isaac, Lyon, France, assignor to Societe Industrielle Generale de Mecanique Appliquee S.I.G.M.A., Paris, France**

**Filed Sept. 25, 1970, Ser. No. 75,343**
**Claims priority, application France, April 8, 1970, 7012759**
**Int. Cl. F16d** *31/06*
**U.S. Cl. 60—53 R** **10 Claims**

The hydrostatic transmission comprises a hydraulic motor as well as a pump of which the cubic capacity is regulated by a mechanism sensitive to the pressure of a liquid. This liquid is supplied by a pressure regulator on the movable member of which act, in the sense tending to increase the pressure, a force increasing with the speed of the pump and, in reverse sense, a force increasing with the resistant couple applied to the motor and a force proportional to said pressure. The transmission is useful for automobiles.



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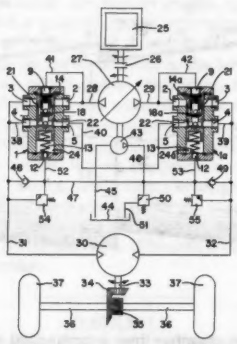
**3,672,167**

## HYDROSTATIC VEHICLE TRANSMISSION

**Karl-Heinz Griesenbrock, Duisburg, Germany, assignor to Eaton Yale & Towne GmbH, Velbert/Rhineland, Germany**

**Filed Nov. 20, 1970, Ser. No. 91,270**
**Claims priority, application Germany, Nov. 21, 1969, P 19 58 436.2**
**Int. Cl. F16d** *31/06*
**U.S. Cl. 60—53 R** **5 Claims**



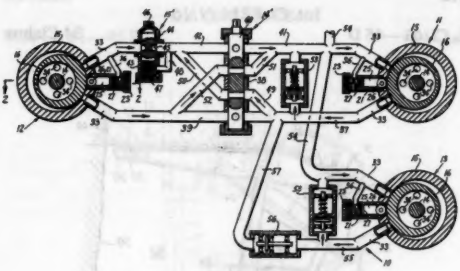
The invention relates to a hydrostatic vehicle transmission having a closed symmetrical circuit and a variable displacement pump with a reversible direction of delivery, and having an anti-pressure-build-up device, by means of which the pressure in the line carrying pressure fluid from the hydraulic motor to the pump is released when, under particular travel conditions, especially during deceleration of the vehicle, the motor acts as pump and vice versa.

3,672,168

## ROTARY PUMP AND POWER TRANSMISSION SYSTEM

Leonard M. Salmon, 2012 Cummings, Mission, Tex.

Filed Nov. 6, 1970, Ser. No. 87,479
Int. Cl. F16d 31/06
U.S. Cl. 60—53 R 5 Claims



A rotary pump and power transmission system in which multiple cam grooves are formed in a rotor and a follower engages in the grooves to form a rotary pump and a rotary motor. A secondary pump is connected in the system to increase the fluid flow to the motor. A four-way reversing valve provides means for reversing the direction of rotation of the motor while continuing to operate the pump in the original direction. A valve is provided in the system actuated by the hydraulic brakes of the vehicle to retard the flow of drive fluid to or from the motor to retard the speed of the vehicle.

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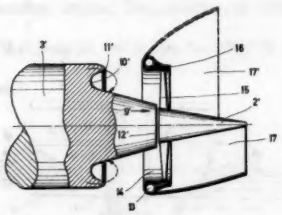
3,672,169

## DRIVE ENGINE HAVING SHROUDED PROPELLER WITH A VARIABLE OUTLET CROSS SECTION

Erich Ufer, Meindorf, Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Ottobrunn near Munich, Germany

Filed Oct. 5, 1970, Ser. No. 77,813
Claims priority, application Germany, Oct. 11, 1969, P 19 51 425.1
Int. Cl. F02k 1/20
U.S. Cl. 60—230 20 Claims



A drive engine includes a rotatable propeller with a shroud around the propeller which carries flaps which extend in the flow direction and which may be moved inwardly and outwardly for varying the shroud outlet cross section. A drive engine is operated to produce a high specific static thrust using the shrouded propeller, for example during take off, when it is in an outward position at which the discharge or outlet is expanded. For a high speed flight the outlet of the shroud is narrowed by moving the trailing ends of the flaps inwardly, for example; this accelerates the main air current inside the shroud for a great specific thrust with reduced shroud drag. In one embodiment, the mounting body for the propeller and the flaps is provided with an annular slot having an auxiliary air current feed for stabilizing potential vortices. Similar potential vortices adjacent the shroud are controlled either by the use of a separate auxiliary ring member associated with the shroud or by using a closed ring having means for discharging a fluid current in the vicinity of the vortex generation. The shroud itself may advantageously be either also provided with or alternatively provided with an annular groove for controlling any vortices in this location.

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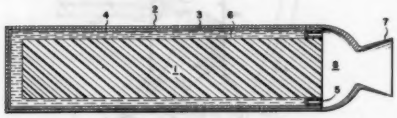
3,672,170

## PROPELLANT GRAIN SUSPENSION SYSTEM

Robert N. Chappell, and Robert L. Carroll, both of Redlands, Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed June 12, 1970, Ser. No. 45,770
Int. Cl. F02k 9/04
U.S. Cl. 60—255 5 Claims



A stress-free propellant grain suspension system wherein the propellant grain is suspended in the motor casing by means of a viscous liquid and the plenum gas pressure.

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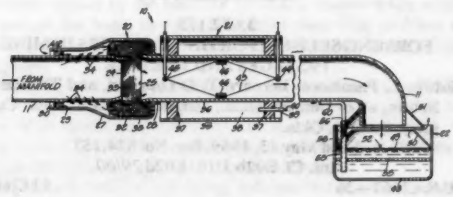
3,672,171

## APPARATUS AND METHOD FOR TREATING ENGINE EXHAUST PRODUCTS TO MINIMIZE HARMFUL CONSTITUENTS

Hrant Eknayan, 7528 Columbia Street, Rosemead, Calif.

Filed Feb. 5, 1970, Ser. No. 8,931
Int. Cl. F01n 3/14; F02b 75/10; F02m 25/06
U.S. Cl. 60—274 16 Claims



A method and accessory for treating engine exhaust products to minimize if not eliminate harmful pollutants present therein as the exhaust products pass through an engine exhaust pipe. The hot exhaust products are exposed to charcoal, copper and heat in the presence of fresh air to combust incompletely burned products and to decompose and absorb nitrogen compounds. Thereafter, the hot exhaust products are exposed to water where remaining traces of nitrogen compounds are absorbed before the treated exhaust products are wasted into the atmosphere. Vaporized water containing absorbed nitrogen compounds is returned to the carburetor intake in pre-heated condition.

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3,672,172

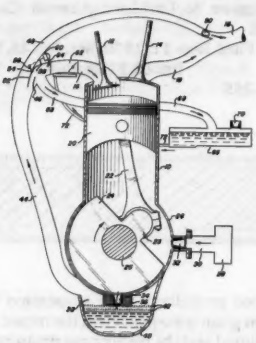
## SIMPLIFIED SUPERCHARGED INTERNAL COMBUSTION ENGINE WITH EMISSIONS CONTROL

Gary L. Hammond, R.R. 4, Macomb, Ill.

Filed March 15, 1971, Ser. No. 124,044
Int. Cl. F01n 3/10, 7/00
U.S. Cl. 60—282 10 Claims

Internal supercharging of non-radial, reciprocating internal combustion engines is achieved by means of a unique form of crankcase compression. The engine includes a sealed crank-

case and a first one-way valve in fluid communication with the crankcase and disposed so that external air is induced into the crankcase upon movement of the piston in one direction. An air reservoir is provided in fluid communication with the crankcase and a second one-way valve is disposed between the crankcase and the air reservoir so that air in the crankcase is forced into the reservoir upon movement of the piston in the reverse direction, the net effect being a positive displacement



supercharger. Passageways are provided for introducing the resulting pressurized air into the cylinder and separately into the exhaust for afterburning purposes, a pressure regulator proportioning the airflows thereto. The pressurized air also pressurizes the fuel tank and thus the fuel supply to the engine. In a particular embodiment a lubricating oil reservoir is provided adjacent the air reservoir with air-oil separator means therebetween.

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**3,672,173**

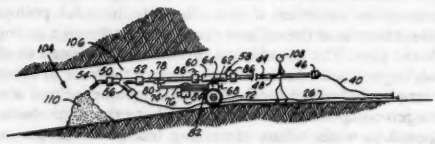
**FORMING SELF-SUPPORTING BARRIERS IN MINE PASSAGES AND THE LIKE**

**Edwin L. Paramore; Bernard T. O'Loughlin, and Thomas L. Brown, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.**

**Filed May 13, 1969, Ser. No. 824,157**

**Int. Cl. E02b *3/16*; E02d *29/00***

**U.S. Cl. 61—36** **52 Claims**



The present invention relates to methods and apparatus for remotely forming self-supporting water impermeable barriers in mine passages and the like. A fast setting cementitious composition is formed by combining an aqueous slurry of cement with an aqueous silicate solution. The cementitious composition thus formed is continuously deposited transversely on the floor and walls of a mine passage by apparatus extending into the mine passage through the mine opening, or through a bore drilled into the passage from the ground surface. The cementitious composition sets into a firm impermeable mass as it is being deposited thereby forming a firm self-supporting barrier in said passage.

**3,672,174**

**METHOD AND APPARATUS FOR SUPPORTING THE ROOFS IN UNDERGROUND EXCAVATIONS**

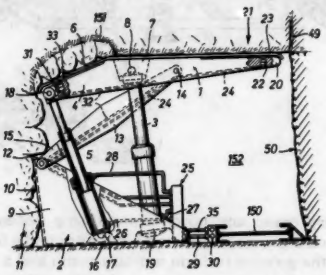
**Hansjoachim Von Hippel, 4628 Linen F 2286 Muhlenkamp 12, 7771 Oberstenweiler, Germany**

**Filed Sept. 8, 1970, Ser. No. 70,048**

**Claims priority, application Germany, Dec. 4, 1969, P 19 60 807.2**

**Int. Cl. E21d *11/16***

**U.S. Cl. 61—45 D** **34 Claims**



A walking mine roof support wherein one or more roof engaging caps are pivotable on the upper end of at least one extendable pit prop which is mounted on the floor engaging base. Balancing rams connect the rear ends of the caps with the base or such rams carry bars which are movable against the roof behind the caps. The props and the rams are operated by a hydraulic control system in response to signals from pressure gauges mounted on the front and rear ends of the caps. Such signals indicate changes in pressure which the mine roof exerts against the respective ends of the caps.

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**3,672,175**

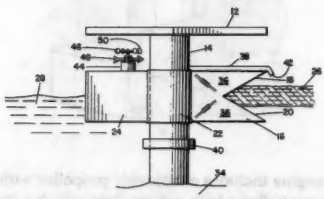
**ICE CUTTER**

**Charley Mack Mason, Denton, Tex., assignor to Sun Oil Company, Dallas, Tex.**

**Filed Oct. 2, 1970, Ser. No. 77,507**

**Int. Cl. E02b *15/02*; B63b *35/12***

**U.S. Cl. 61—46** **10 Claims**

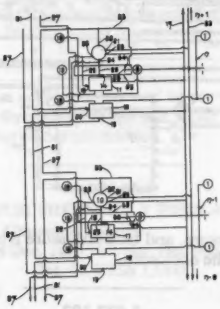


A cutter rotatably mounted on a marine structure for cutting and diverting encroaching ice floes. The cutter has upper and lower cutting edges that are angled from one another and intersect. Sides angle away from the cutting edges, and the trailing edge of the sides flare outwardly to divert the ice around the marine structure. The cutter is attached to a sleeve which rotates around the marine structure in response to a vane member which also acts as a counterweight and is shaped to act as a protected boat dock.

## 3,672,176
## ROOF SUPPORTING SYSTEMS

Karl Maria Groetschel, Bochum, and Utz Groetschel, Munich, both of Germany, assignors to Karl Maria Groetschel, by said Utz Groetschel

Filed Dec. 18, 1970, Ser. No. 99,496
Claims priority, application Germany, Dec. 18, 1969, P 19 63 558.6
Int. Cl. E21d 23/18
U.S. Cl. 61—45 D 14 Claims

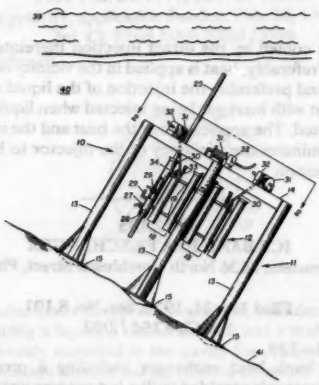


The invention comprises a roof supporting system for use in a mine working employing a row of roof supports each having an inner unit and an outer unit incorporating hydraulic props and advanced in turn by hydraulic ram means. A control valve provided on each of the supports can be moved into a position to depressurize the props of the inner unit of that support to pressurize the props of an outer unit on an adjacent one of the supports in the system and advance these two units simultaneously so that each support need be visited only once by an operator to bring about advancement of all the units in the whole supporting system. Each control valve may have selectively usable outlets to enable the outer unit of an adjacent support on one side or the other of that incorporating the control valve to be advanced simultaneously with the inner unit of the latter support.

## 3,672,177
## SUBSEA FOUNDATION UNIT AND METHOD OF INSTALLATION

William F. Manning, Dallas, Tex., assignor to Mobil Oil Corporation

Filed June 24, 1970, Ser. No. 49,372
Int. Cl. E02b 17/00, 17/08
U.S. Cl. 61—46.5 14 Claims

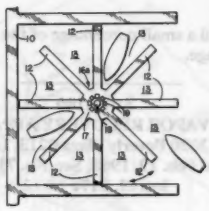


The specification discloses a subsea foundation unit for use in drilling and completing a plurality of submerged wells particularly in areas where the marine bottom slopes or is uneven. The unit is comprised of a base and a drilling and completion template. The unit is lowered in the water until the base engages the marine bottom. The template is adjusted with relation to the base until the template is substantially level. Next, the template is secured to the bottom and is released from the base. The base is removed leaving only the leveled template on the bottom.

## 3,672,178
## ROTARY DOCK

Paul A. Trautwein, 1906 Holiday Road, Newport Beach, Calif.

Filed Nov. 23, 1970, Ser. No. 91,921
Int. Cl. E02d 29/06
U.S. Cl. 61—46 7 Claims



This disclosure relates to the berthing of boats, and to the problem caused by the need for providing maneuvering room to permit the boats to enter their boat slips. This problem is particularly acute for larger boats and for the less experienced skippers.

The disclosed invention teaches the use of a rotary dock, somewhat similar to a merry-go-round, having a plurality of boat slips associated therewith. In use, the rotary dock is rotated so that any given one of the plurality of boat slips may be positioned at any desired peripheral location.

Thus, in the case of a mooring arrangement in a marina, any boat slip of the rotary dock may therefore be positioned at a peripheral location that facilitates the boat's entering or leaving the channel, whereas, in the case of a marine service station that is already crowded with boats being serviced, the rotary dock may be rotated so that an emoty boat slip in in location to receive the newly arrived boat. In the case of a boat rental or a boat sales agency having a large inventory of boats, the rotary dock may be rotated so that any desired boat of the inventory may be made available for customer examination or use.

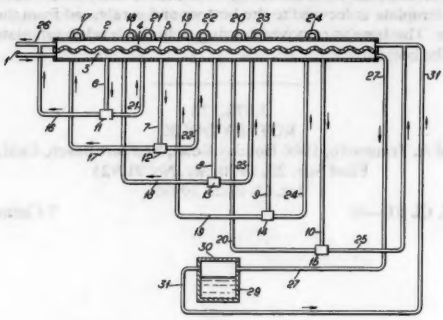
## 3,672,179
## GAS LIQUIFACTION

Richard W. Foster-Pegg, Warren, Pa., assignor to Struthers Energy Systems, Inc.

Filed Aug. 4, 1970, Ser. No. 60,877
Claims priority, application Great Britain, Aug. 6, 1969, 39,401/69
Int. Cl. F25b 9/02
U.S. Cl. 62—5 3 Claims

A gas under pressure enters a single counter-flow heat exchanger haVing a high pressure entrance side and a low pressure exhaust side, the gas from the high pressure side being connected in parallel to a number of Ranque tubes in which the gas expands. The hot and cold streams from the

tubes are connected along the length of the low pressure side of the heat exchanger to progressively cool gas in the high pressure side until a small percentage of the gas can be flashed to liquid for storage.



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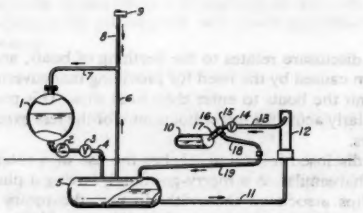
**3,672,180**
**FUEL VAPOR RECOVERY APPARATUS**
**Edwin R. Davis, 2020 Beverly Plaza 0213, Long Beach, Calif.**
**Filed Feb. 19, 1968, Ser. No. 714,189**
**Int. Cl. F17c *13/12***
**U.S. Cl. 62—54** **9 Claims**



A fuel recovery apparatus including a service station storage tank and a fuel transfer line for connection with a truck tank. Condenser means is provided for receiving vapor expelled from the storage tank during filling thereof and the condensed fuel is returned to the storage tank in liquid form. A vapor return conduit may be provided for cycling the expelled vapor back to the ullage in the truck tank during emptying thereof.

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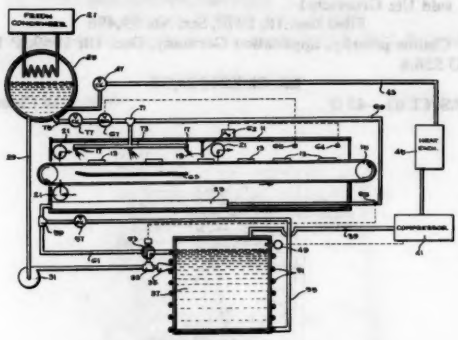
**3,672,181**
**METHOD AND APPARATUS FOR CARBON DIOXIDE COOLING**
**Lewis Tyree, Jr., 10401 South Oakley Avenue, Chicago, Ill.**
**Filed Feb. 26, 1970, Ser. No. 14,575**
**Int. Cl. F25d *13/06***
**U.S. Cl. 62—63** **17 Claims**

Apparatus for cooling articles using carbon dioxide as a refrigerant including an enclosure adapted for cooling articles to be conveyed therethrough and a cooling system having snow nozzles in the upper portion thereof. A heat-exchanger is disposed in a lower portion of the enclosure and a conduit connects a source of high pressure $CO_2$ to the inlet of the heat-exchanger. The outlet from the heat-exchanger is connected to the snow nozzles whereby snow falling into the lower portion of the enclosure and coming to rest on the heat-exchanger absorbs heat during its change of state thereby precooling the high pressure $Co_2$. The orifice openings in the nozzles are varied with pressure, and blowers assure a blizzard of snow is created within the enclosure.



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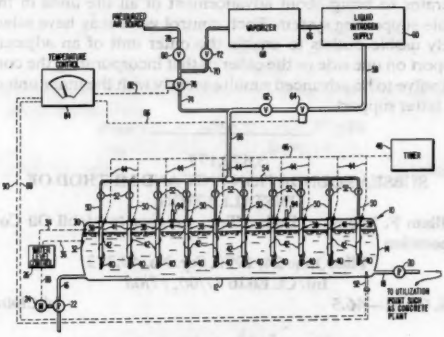
**3,672,182**
**WATER COOLING METHOD AND APPARATUS EMPLOYING LIQUID NITROGEN**
**William F. Stowasser, and Keith A. Miller, both of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.**
**Filed June 25, 1970, Ser. No. 49,859**
**Int. Cl. F25d *17/02***
**U.S. Cl. 62—98** **20 Claims**



Water is cooled by the direct injection thereinto of liquid nitrogen. Preferably, heat is applied in the vicinity of the injection zone and preferably the injection of the liquid nitrogen is intermittent with inert gas being injected when liquid nitrogen is not injected. The application of the heat and the injection of the gas eliminates the tendency of the injector to be plugged by ice formation.

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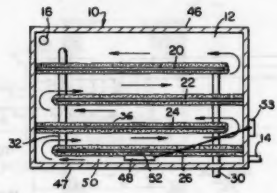
**3,672,183**
**ICE BANK HEAT EXCHANGER**
**Arthur Bernstein, 2636 North Hutchinson Street, Philadelphia, Pa.**
**Filed Jan. 21, 1970, Ser. No. 8,101**
**Int. Cl. F25d *17/02***
**U.S. Cl. 62—139** **1 Claim**

An ice bank heat exchanger including a process water retaining reservoir provided with a hot process water inlet and a water outlet returning cooled water to the process equipment, a refrigeration unit associated with the said reservoir

and expanding through evaporator coils contained within the said water reservoir, the evaporator coils being affixed to ice bank plates which are arranged within the reservoir to freeze




the stored process cooling water and to provide a serpentine water path therethrough from the hot water inlet connection to the cooled water outlet connection.

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**3,672,184**

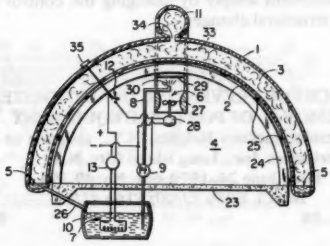
**APPARATUS FOR THERMALLY INSULATING A BODY**

**Sten Olof Zellon, Glumslov, Sweden**

**Filed Dec. 10, 1969, Ser. No. 883,744**

**Int. Cl. F25b** *13/00*

**U.S. Cl. 62—324** **15 Claims**




A thermal insulation is obtained by producing foam, introducing the foam into the insulating space, collecting the liquid formed upon the collapse of the foam, again transforming said liquid into foam and introducing the foam into the insulating space to replace the collapsed foam.

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**3,672,185**

**IMPULSE MOTOR**

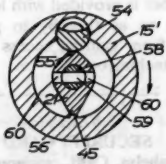
**Knut Christian Schoeps, Nacka, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden**

**Filed Feb. 24, 1970, Ser. No. 13,283**

**Claims priority, application Sweden, Feb. 28, 1969, 2842/69**

**Int. Cl. F16d** *3/80;* **B25d** *15/00*

**U.S. Cl. 64—26** **15 Claims**




A impulse motor comprises a rotatable cylinder with a cavity containing a liquid, a rotatable anvil and a sealing member being movably mounted in the cavity for cyclically passing a sealing position therein during relative rotations between the cylinder and anvil, in which sealing position the sealing member separates a chamber in the cavity disposed between the cylinder and anvil and of decreasing liquid volume during continued rotation of the cylinder. The impulse motor has a relief valve in the cylinder and means for controlling the relief valve in dependence upon the rotation of said cylinder for keeping during subsequent passages of said sealing member past said sealing position firstly at least once in sequence the said chamber open in said cavity for permitting acceleration of the cylinder during more than one revolution thereof and thereupon closed for producing a pressure impulse in said chamber active to rotate the anvil.

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**3,672,186**

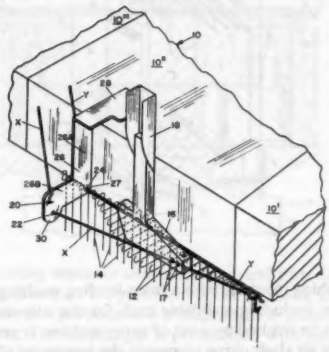
**METHOD AND APPARATUS FOR FORMING A RIB FABRIC HAVING A TWO-PLY SECTION**

**Joseph Rab, New York, N.Y., assignor to Knit Tech Development Corporation**

**Filed April 10, 1970, Ser. No. 27,239**

**Int. Cl. D04b** *9/06, 15/54*

**U.S. Cl. 66—25** **5 Claims**




The method of knitting two-ply segments extending coursewise of a rib fabric on a knitting machine of the type having two sets of needles, for example cylinder and dial needles, a plurality of feeds, and means at a selected feed for guiding the yarn forming each ply into the path of the hooks of the needles on which it is being knit and into the hook-opposite side of the other set of needles. The feeding of the yarns to their respective sets of needles is carried on at a single yarn feed without reliance on any special cams or delayed timing.

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**3,672,187**

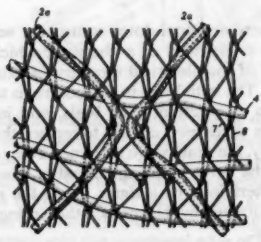
**FABRIC**

**Elsworth C. Simpson, Glens Falls, N.Y., assignor to Polylok Corporation, New York, N.Y.**

**Filed May 19, 1967, Ser. No. 639,836**

**Int. Cl. D04b** *23/10*

**U.S. Cl. 66—192** **14 Claims**




A fabric having a layer of substantially spaced apart design elements which are laid on a cloth substrate, in the warp

direction. along nonlinear paths is disclosed. The design elements are affixed to the substrate and other optional components of the fabric by knit-stitching with parallel rows of stitches forming a series of loop chains.

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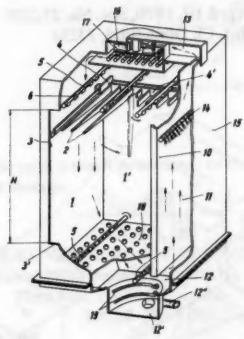
**3,672,188**
**WASHING MACHINE**

**Hugo Werner Geschka, Angermund; Wolfgang Oberhoff, Krefeld, and Klaus Korb, Lintorf, all of Germany, assignors to Beges AG, Chur, Switzerland**

**Filed April 20, 1970, Ser. No. 30,128**
**Claims priority, application Germany, April 18, 1969, P 19 19 730.9; Aug. 28, 1969, P 19 43 690.9**
**Int. Cl. B05c** *5/00*
**U.S. Cl. 68—12 R** **23 Claims**



A washing machine with a front-loading washing and drying chamber, including a slidable rack for the suspension of garments to be washed by a set of spray nozzles, is provided with a narrow air shaft rising alongside the treatment chamber and communicating with it at the top and bottom, the air being circulated in a drying phase along a closed path by a blower above the chamber. A sprinkler disposed in the upper part of the air shaft serves to condense the steam entrained with the circulating air, its jets being intercepted by a textile liner on the shaft wall which guides the water down to a collecting trough at the chamber bottom. In a washing phase, with the spray nozzles operating, solution accumulating in the trough is recirculated after reheating by a heater split into two sections, one of them being energized continuously during a warmup period while the other is energized only during standstill of the intermittently operated recirculation pump.

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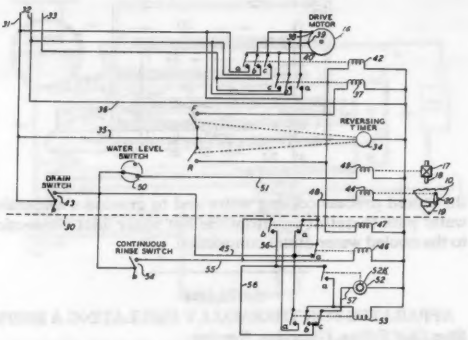
**3,672,189**
**CONTINUOUS RINSE AND COOL-DOWN CONTROL**

**Richard A. High, and George J. Vesper, both of Cincinnati, Ohio, assignors to McGraw-Edison Company, Elgin, Ill.**

**Filed Aug. 12, 1970, Ser. No. 63,069**
**Int. Cl. D06f** *33/02*
**U.S. Cl. 68—12 R** **8 Claims**

A continuous rinse and cool-down control for washers and washer-extractors is provided of a character which requires modification only of the electrical circuitry of existing commercial machines. The initial step in this control is to open the drain valve on an intermittent time basis, and in response water is added by a water level control to replace that which is drained. Preferably, the drain valve is opened every other time the direction of the drive is changed, and is closed after a preset interval determined by a timer. Since the machine is never completely drained by this method the rinsing operation is a continuous one.

A continuous rinse is advantageous in that it achieves economy in time used to complete a rinse operation. Prior methods of obtaining continuous rinsing have operated generally on some form of flow-through principle, and commonly included a weir arrangement. The present invention resides in an arrangement whereby increments of the bath are intermittently discharged by periodically opening the drain valve, and fresh water is admitted to replenish what is




discharged each time, controlled by a bath-level switch. Further, it is a feature that existing commercial machines of both the tub and shell-less types can be modified to perform these new functions simply by changing the control circuity without any structural changes.

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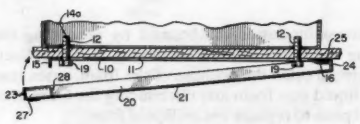
**3,672,190**
**DEVICE FOR PREVENTING UNAUTHORIZED REMOVAL OF PORTABLE EQUIPMENT**

**Mario Palazzolo, Jackson Heights, N.Y., assignor to Di Mar Metal Fabricators, Inc., Long Island City, N.Y.**

**Filed June 24, 1970, Ser. No. 49,394**
**Int. Cl. E05b** *73/00*; **F16b** *41/00*
**U.S. Cl. 70—58** **8 Claims**



A device to prevent theft or other unauthorized removal of portable equipment, such as typewriters, adding machines and the like, from their normal location or places of use. The protective device comprises a bar readily attachable by fasteners passing through the bar and through openings in the desk top, shelf or other supporting member, and into the base of the piece of portable equipment. The latter is thus held in firm engagement with the supporting member. Access to the attaching bar and fasteners is prevented by a trough-like member which encases the attaching bar and the fasteners. The encasing member is provided with lock means for securing it in position, so as thereby to prevent any but an authorized person from gaining access to the fasteners associated with the attaching bar.

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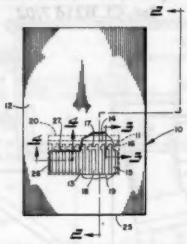
**3,672,191**
**SECURITY CARD**

**John F. Regan, Anaheim, Calif., assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Aug. 14, 1970, Ser. No. 63,717**
**Int. Cl. E05b** *19/00*
**U.S. Cl. 70—393** **7 Claims**

A security card for use with electronic locks, accounting systems and other electrical identification and data processing systems comprising a plastic wallet-size card with a coded per-

mutation circuit imbedded in the card. Terminals connected to the circuit are exposed through a window in at least one side of the card for mating with matching contacts in a recep-



tacle at a remote station of a security system. The terminals are spaced from the inserting edge of the card a sufficient distance to avoid physical damage.

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**3,672,192**

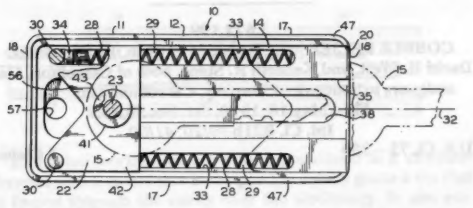
**SPRING RETRACTABLE CAR KEY**

**Vassilios Dontas, 6056 West A, West Linn, Oreg.**

**Filed Feb. 17, 1971, Ser. No. 116,191**

**Int. Cl. A47g *29/10*; E05b *19/00***

**U.S. Cl. 70—414** **5 Claims**



A retractable key holder has a carriage disposed within to which a key is releasably clamped by a shoulder on a shaft threadedly engaged with such carriage and extending exteriorly of the holder. A pair of compression springs are disposed in the body of the holder in parallel relation to the key. Prongs extending from one side of the carriage are engageable with the springs. Pressure applied to an actuator carried by the shaft slides the carriage and the clamped key to an extended position causing the prongs to compress the springs and bias the key toward its retracted position.

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**3,672,193**

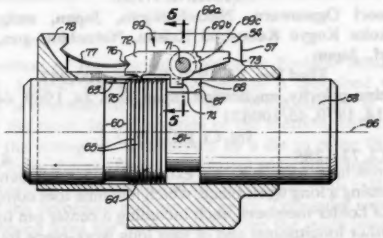
**PRESSER TOOL WITH FAULTY OPERATION LOCK**

**Teddy M. Schiller, Huntington Beach, Calif., assignor to Purex Corporation, Lakewood, Calif.**

**Filed April 30, 1970, Ser. No. 33,183**

**Int. Cl. B21d *55/00***

**U.S. Cl. 72—4** **10 Claims**



A crimping tool employing a fluid pressure operated reciprocable ram. Ratchet means is provided to prevent faulty crimping operations including a ratchet tooth movable with the ram and a pawl adapted to engage the tooth against return movement of the ram in response to a crimping stroke of less than a predetermined length.

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**3,672,194**

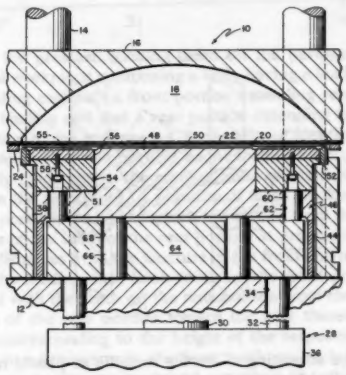
**FORMING AND TRIMMING APPARATUS FOR HYDROFORM PRESS**

**John J. Martin, Milford, Conn., assignor to Avco Corporation, Stratford, Conn.**

**Filed Nov. 20, 1970, Ser. No. 91,288**

**Int. Cl. B21d *28/18***

**U.S. Cl. 72—55** **5 Claims**



A device having separate shape-forming and trim die portions is incorporated in a hydroform press. A blank sheet is placed over the die portions and a diaphragm is placed over the blank sheet. The diaphragm is pressurized with hydraulic fluid and then only the shape-forming die portions are urged into the flexible die element to shape and trim the element in a single cycle of the machine.

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**3,672,195**

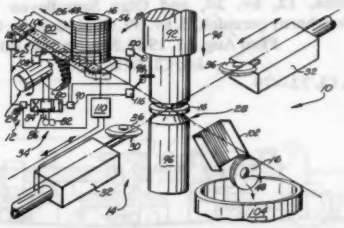
**AUTOMATIC LOADING DEVICE FOR PULLEY SPLITTING MACHINE**

**Matthew Pacak, Solon, Ohio, assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Jan. 22, 1970, Ser. No. 4,932**

**Int. Cl. B21h *1/04***

**U.S. Cl. 72—71** **1 Claim**

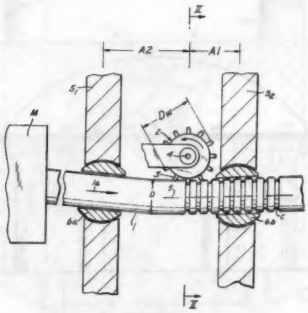


An apparatus for making grooved wheels includes a metal blank feeder and a forming mechanism for forming grooves in the metal blanks. The feeder includes a retaining means for retaining a supply of metal blanks and a mechanism for feeding the blanks from the supply into position so that the forming mechanism can work thereon. The forming mechanism includes tools which split the peripheral edge of the metal blank while the blank is being rotated. The feeding mechanism operates to eject a completed grooved wheel from the forming mechanism while positioning another metal blank to be formed in the forming mechanism.

## 3,672,196
## METHOD AND APPARATUS FOR MAKING CORRUGATIONS IN TUBES CONSISTING OF DUCTILE MATERIAL

Friedrich Levacher, Brauweiler; Hans Leo Ditscheid, Refrath; Walter Burger, Bechen; Peter Asselborn, and Werner Cramer, both of Bergisch Gladbach, all of Germany, assignors to Felten & Guilleaume Kabelwerke Aktiengesellschaft, Cologne-Mulheim, Germany

Filed July 13, 1970, Ser. No. 54,247
Claims priority, application Germany, Aug. 2, 1969, P 19 39 402.6
Int. Cl. B21d *15/06*
U.S. Cl. 72—77 24 Claims

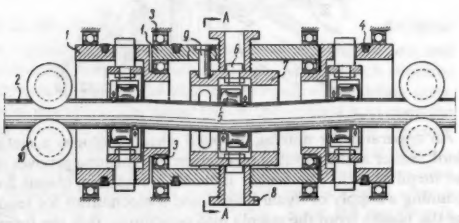


A tube consisting of ductile metallic or plastic material is provided with circumferentially complete corrugations, helical grooves and/or axially parallel grooves while it travels between two universally movable bearings so that it can flex sideways without any appreciable elongation or hardening of its material. The grooves or corrugations are formed by tools having concave tube-engaging faces and rotatably mounted in a holder which orbits about the tube between the two bearings. The tools can be fixedly or adjustably mounted in the holder; in the latter instance, a single set of tools can be used to form circumferentially complete corrugations, helical grooves or axially parallel grooves.

## 3,672,197
## STRAIGHTENING MACHINE FOR PIPE-LIKE ARTICLES

Boris Vasilievich Popov, ulitsa Zelenodolskaya, 24, kv. 110; Alexandr Zosimovich Slonim, Pushkinskaya ulitsa, II, kv. 43; Anatoly Leonidovich Sonin, ulitsa Korleva, 9, korpus 2, kv. 152; Gennady Konstaninovich Zhukov, Kubanskaya ulitsa, 12, kv. 24, and Olga Samullovna Zhokhova, 2 Goncharny pereulok, 3, kv. 39, all of Moscow, U.S.S.R.

Filed Aug. 11, 1969, Ser. No. 849,009
Int. Cl. B21d *3/06*
U.S. Cl. 72—79 2 Claims

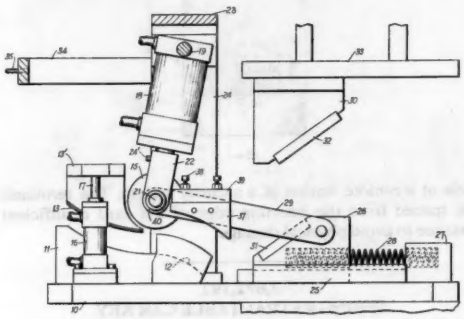


For straightening pipes, there is provided a machine with input and output rollers between which are rotatably and coaxially arranged three casings internally carrying tongue passes which engage and straighten the pipes. The casings are driven in opposite directions.

## 3,672,198
## FENDER FLAIRING APPARATUS

Roman J. Gasiorowski, Little Rock, Ark., assignor to AMF Incorporated

Filed April 6, 1970, Ser. No. 25,952
Int. Cl. B21d *7/02*
U.S. Cl. 72—215 5 Claims

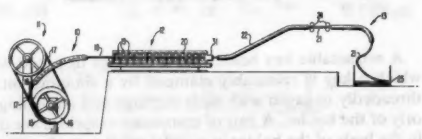


The reverse curl on the end of an arcuate fender is roll-formed between a stationary curved die and a movable roller die which is rolled along the stationary die.

## 3,672,199
## COBBLE RELIEF MECHANISM FOR ROLLING MILL

David H. West, and Kenneth R. Stone, both of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Filed May 18, 1970, Ser. No. 38,393
Int. Cl. B21b *39/20, 41/00*
U.S. Cl. 72—250 6 Claims



A cobble relief mechanism for a rolling mill of a continuous metal casting and rolling system wherein the accumulation of rod within the mill housing is relieved by opening a portion of the housing and allowing the rod to play out of the opening. The housing is opened in response to the buildup of the rod within the housing, and when the rod is allowed to escape from the confines of the housing the hazard of damage to the rolling mill components is reduced and the entangled rod is played out beyond the housing until the operation of the rolling mill is terminated.

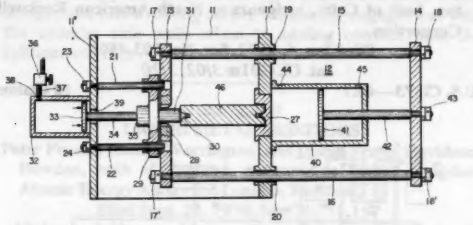
## 3,672,200
## MACHINE TOOL

Sadanori Ogasawara, Nakashim-gun, Japan, assignor to Aikoku Kogyo Kabushiki Kaisha, Nakashima-gun, Aichi, Pref., Japan

Filed Dec. 23, 1970, Ser. No. 100,947
Claims priority, application Japan, Dec. 24, 1969, 44/1386; Nov. 14, 1970, 45/100621
Int. Cl. B21c *3/12*
U.S. Cl. 72—285 4 Claims

A machine tool, e.g., an extruder or a push bench, for processing a long work-piece, which machine tool comprises a pair of holder members, each including a center pin for holding either longitudinal end of said long work-piece by engaging one of center holes prebored on opposite edge surfaces of the work-piece, a die capable of shaping said work-piece, and

a hydraulic piston-cylinder device for moving said die while causing the die to operatively engage the work-piece. The hydraulic piston-cylinder device includes a driving portion for



actuating the die and a compensating portion for selectively releasing the stress in the work-piece during the working by the die.

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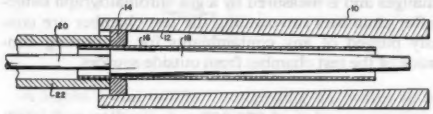
**3,672,201**

**METHOD AND APPARATUS FOR SHAPING TUBES**

**John W. Hinshaw, Garden Grove, Calif., assignor to The Battelle Development Corporation, Columbus, Ohio**

**Filed May 19, 1969, Ser. No. 825,482**
**Int. Cl. B21c *3/12***
**U.S. Cl. 72—285** **16 Claims**



Elongated workpieces are axially positioned in a chamber formed with a cavity that is designed to axially guide a die that is forced through the cavity over the workpiece. In one embodiment a tubular workpiece is shaped by both the die and a mandrel. In another embodiment the die is a deformable die and the cavity tapers so that the die is caused to close over and shape the workpiece during drawing.

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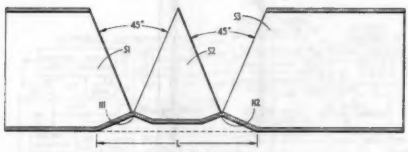
**3,672,202**

**METHOD OF MAKING WAVEGUIDE BEND**

**Wayne Barber, Bedford, Mass., assignor to Microwave Development Laboratories, Inc., Needham Heights, Mass.**

**Filed Sept. 15, 1970, Ser. No. 72,279**
**Int. Cl. H01p *11/00***
**U.S. Cl. 72—369** **2 Claims**



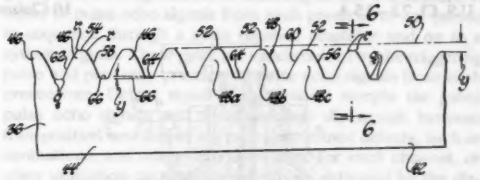
A method of forming an H-plane or E-plane bend in a straight, hollow, rectangular waveguide is described which permits a decrease in the "a" or "b" dimension in going around the bend. In the practice of the method, part of one wall of the waveguide is deformed by a die to cause the wall portion to be sheared from the adjacent walls and pressed into the waveguide. The portions of the waveguide walls extending outside the deformed wall are cut away. Triangular segments are removed from the waveguide to form the guide into three sections. The three sections are then folded together to make the bend.

**3,672,203**

**TOOTH FORMING TOOL**

**Marvin R. Anderson, 17 Deeplands South, Grosse Pointe Shores, Mich.**

**Filed Feb. 8, 1971, Ser. No. 113,227**
**Int. Cl. B21h *5/02***
**U.S. Cl. 72—469** **12 Claims**



A tool for pressure forming teeth on the periphery of a cylindrical workpiece comprising a body having a leading end and a trailing end with a front portion extending rearwardly from the leading end and a rear portion extending from the front portion to the trailing end. A plurality of identical teeth are provided on the rear portion, each of which has a configuration fully conjugate to the configuration of the teeth to be formed on the workpiece. A plurality of teeth are formed on the front portion, the tips of which are spaced from the plane of the tips of the teeth of the rear portion at progressively increasing distances from the juncture of the front and rear portions to the leading end. Each tooth on the front portion is congruent with the teeth on the rear portion from the tips of the teeth of the rear portion toward the root thereof for a distance corresponding to the height of the respective front tooth. In one arrangement, the front teeth are each inclined with respect to the rear teeth and are otherwise of identical size to the rear teeth. In another arrangement, the body has a root line common to both the front and rear portions, and the front teeth are each of progressively decreasing height above the root line from the juncture of the front and rear portions to the leading end of the body.

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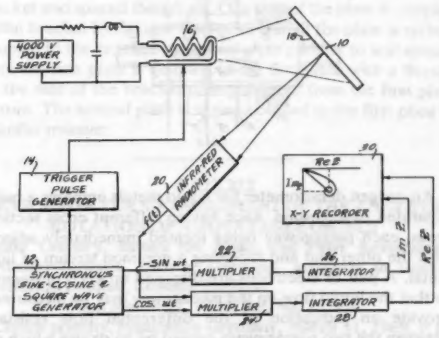
**3,672,204**

**TRANSIENT THERMAL METHOD AND MEANS FOR NONDESTRUCTIVELY TESTING A SAMPLE**

**Donald R. Green, Richland, Wash., assignor to The United States of America as represented by the United States Atomic Energy Commission**

**Filed April 8, 1970, Ser. No. 26,569**
**Int. Cl. G01n *25/00***
**U.S. Cl. 73—15 R** **23 Claims**

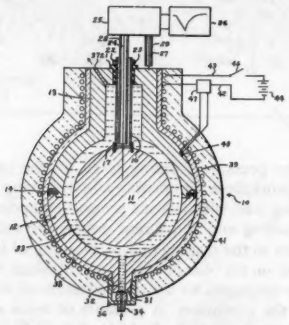



A sample is nondestructively tested by generating and transmitting a transient-function heat flux into a surface of the sample and measuring responsive to the heat flux the surface thermal impedance of the sample at the area thereof in contact with heat flux.

## 3,672,205
## DETERMINATION OF HEAT TRANSFER THROUGH FLUIDS

Wolfgang Leidenfrost, West Lafayette, Ind., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Dec. 14, 1970, Ser. No. 97,597
Int. Cl. G01n 25/18
U.S. Cl. 73—15 A 10 Claims

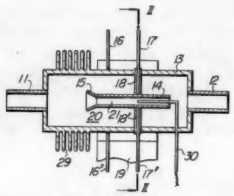


A method is provided for determining the heat transfer properties of a fluid which comprises filling the space between two concentric geometrically similar objects with the fluid to be tested, the objects being in a state of thermal equilibrium; changing the temperature of the outer of the two concentric bodies; measuring the capacitance between the bodies as the temperature of the outer body changes; and measuring the time required for the capacitance measurement to reach a constant value, thereby indicating that the two bodies are in a new state of thermal equilibrium. One of the most important uses of the method is in controlling the quality of industrial products produced by continuous processes.

## 3,672,206
## OXYGEN DENSITOMETER FOR LIQUID METALS

Tadashi Goto, Hitachi-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed July 17, 1969, Ser. No. 842,642
Claims priority, application Japan, July 24, 1968, 43/51863
Int. Cl. G01n 27/08
U.S. Cl. 73—61 7 Claims

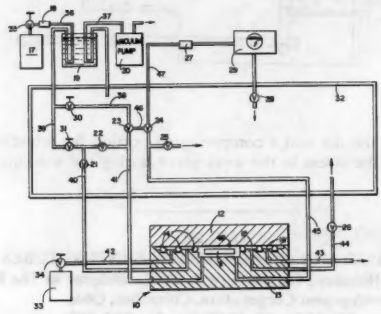


An oxygen densitometer for liquid metals employs a pair of separated passageways, each having different cross sectional areas, each passageway being located immediately adjacent with the other end and receiving a common stream of liquid metal. A pair of electrodes are disposed on each passageway so that the liquid flow on the passageway may be measured to provide an indication of the differential flow resistance between the two passageways caused by an oxides which may exist within the liquid metal. Preferably, the passageways include concentrically disposed tubes and the electrodes attached thereto provide a signal representing flow resistance differential and a thermometer attached thereto provides a signal representing the temperature of the liquid metal.

## 3,672,207
## APPARATUS FOR VERIFYING HERMETICITY OF SMALL ELECTRONIC ASSEMBLIES

Allen R. Cramp, Laguna Beach, and Kenneth J. Brion, Fullerton, both of Calif., assignors to North American Rockwell Corportion

Filed Jan. 4, 1971, Ser. No. 103,450
Int. Cl. G01m 3/02, 3/20
U.S. Cl. 73—40.7 10 Claims

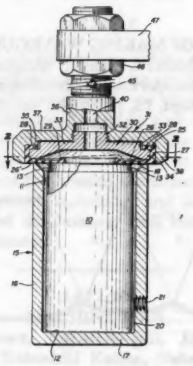


A sealed package in a test chamber is exposed to the flow of a high purity inert carrier gas at a lower than atmospheric pressure. If the sealed package leaks, the carrier gas purity level changes and is measured by a gas chromatograph detector. Buffer chambers surrounding the test chamber are continuously purged of any contaminants for preventing contamination of the test chamber from outside sources.

## 3,672,208
## TESTING DEVICE FOR TESTING EDGES OF CYLINDERS FOR DEFECTS

Ronald A. Pearce, Lakewood, Colo., assignor to Coors Container Company, Golden, Colo.

Filed Sept. 25, 1970, Ser. No. 75,555
Int. Cl. G01m 3/32
U.S. Cl. 73—49.2 6 Claims



A testing device for testing edges of cylinders for defects comprising a flexible diaphragm member and a holder for said member through which compressed air is injected into a cylinder to be tested while the diaphragm is in cylinder sealing position relatively to the end of the cylinder. The cylinder is positioned in a pressure casing which provides an air chamber between the casing and the cylinder. Measurement of the air pressure in the chamber indicates whether any compressed air has leaked out of the cylinder due to defect in the cylinder.

The diaphragm-sealing member comprises a flexible bearing wall sealing the end of the cylinder to be tested, said bearing wall becoming deformed under light pressure without being compressed and avoiding defect-concealing engagement with the cylinder side walls when in sealing contact with the cylinder and edge.

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## 3,672,209
## LIQUID METAL MONITORS

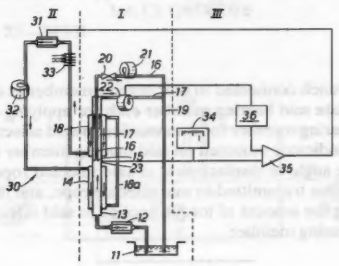
**Peter Francis Roach, Warrington, and Daniel Fraser Davidson, Bowdon, both of England, assignors to United Kingdom Atomic Energy Authority, London, England**

**Filed Sept. 24, 1970, Ser. No. 75,157**

**Claims priority, application Great Britain, Oct. 7, 1969, 49,317/69**

**Int. Cl. G01n *11/00, 25/02***

**U.S. Cl. 73—61 LM** **4 Claims**




A liquid metal monitor comprising an orifice in a liquid metal flow path which orifice can be at least partially plugged by impurity precipitated from liquid metal in the flow path, a division of the liquid metal flow at the orifice into two parts so that subsequently one of the parts passes through and the other part by-passes the orifice, characterized in that heat transfer means are provided for transferring heat energy from the liquid metal in the flow path upstream of the orifice to liquid metal in the flow path down stream of the orifice.

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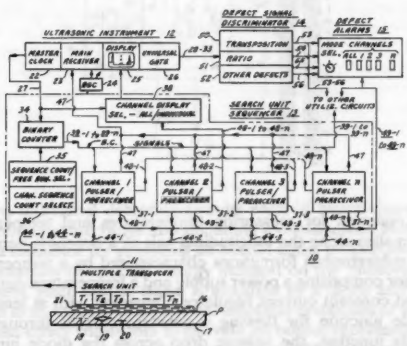
## 3,672,210
## ULTRASONIC INSPECTION SYSTEM WITH SCANNED MULTIPLE TRANSDUCERS

**Russell N. Cressman, Center Valley; Walter J. Bantz, and Edward M. Nusbickel, Jr., both of Allentown, all of Pa., assignors to Bethlehem Steel Corporation**

**Filed Nov. 20, 1969, Ser. No. 878,488**

**Int. Cl. G01n *29/04***

**U.S. Cl. 73—67.9** **6 Claims**




Portable ultrasonic search unit has multiple transducers, each located over an incremental surface of a metallic workpiece. Each transducer is connected to a combined pulser/prereceiver operating under control of a single gate. A binary counter, driven by a triggering pulse from a clock, issues binary coded channel selecting signals. Each control gate also functions as a decoder of these signals and enables itself unassisted by other circuitry and in sequence with the other gates, thus causing electronic scanning of the transducers. A series of pulse echo signals from each prereceiver are passed in sequence through a main receiver amplifier and on to a system of gates. These gates are synchronized by the triggering pulse and pass only preselected pulse echo signals from each prereceiver. Defect signal discriminators sample the gated pulse echo signals and simultaneously distinguish between transposition and amplitude ratio determined defects, such as laminations, and other defects. Alarms for each channel, or other utilization circuits, are selectively activated by the discriminator outputs when combined with channel selecting signals.

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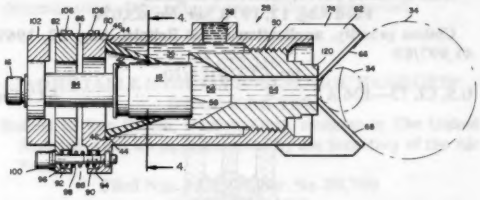
## 3,672,211
## ULTRASONIC SEARCH UNIT

**Gordon H. Hatch, Brookfield, Conn., assignor to Automation Industries, Inc., Century City, Calif.**

**Filed June 1, 1970, Ser. No. 42,076**

**Int. Cl. G01n *29/04***

**U.S. Cl. 73—71.5** **6 Claims**



Herein described is an ultrasonic nondestructive material tester which is useful in testing cylindrical objects, such as pipes or rods. Included in the device is a search unit, comprised of a housing which includes a pair of shoes outwardly extending therefrom, which is adapted to ride on the outside diameter of the pipe or rod. A search unit is disposed in a manner so that ultrasonic energy radiated therefrom is always normal to the outside diameter of the workpiece. A bracket is affixed to the housing and a plate is positioned parallel to the bracket and spaced therefrom. One side of the plate is coupled to the bracket by flexure. The other side of the plate is spring-coupled to the bracket. A second plate parallel to and spaced from the first plate is coupled to the first plate with a flexure on the side of the bracket ninety degrees from the first plate flexure. The second plate is spring-coupled to the first plate in a similar manner.

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## 3,672,212
## DEVICE FOR THE MEASUREMENT OF THE ANGLE OF ROTATION OF A ROTATABLE OBJECT

**Rudolf Caspary, Hanau am Main, and Peter Kretschmer, Niederrodenbach, both of Germany, assignors to Dunlop Holdings Limited, London, England**

**Filed March 27, 1970, Ser. No. 23,398**

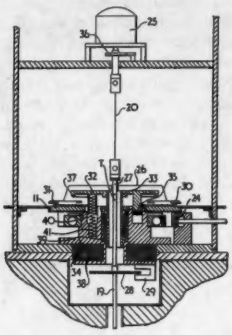
**Claims priority, application Germany, March 31, 1969, P 19 16 525.4**

**Int. Cl. G01h *3/26***

**U.S. Cl. 73—99** **12 Claims**

A device for the accurate measurement, despite misalignment of parts, of the angle of rotation or twist of an object capable of being rotated or twisted e.g. a test-piece in a torsion-testing apparatus. The device incorporates opposed con-

tacts normally held free of an associated annular resistor or resistors, the contacts being connected to a summing circuit



which compensates for errors arising from the angular measurement of voltage to arrive at the angle of rotation or twist.

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**3,672,213**

**TORQUE TRANSDUCERS**

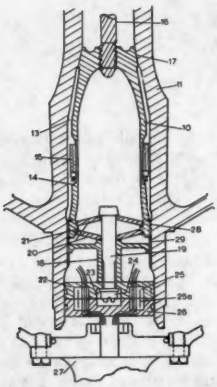
**Kenneth Watson, Yeovil, England, assignor to Westland Aircraft Limited, Yeovil, Somerset, England**

**Filed Aug. 12, 1970, Ser. No. 63,074**

**Claims priority, application Great Britain, Aug. 22, 1969, 41,997/69**

**Int. Cl. G01l 3/10**

**U.S. Cl. 73—136 A** **6 Claims**



A torque transducer for insertion within a hollow shaft consisting of a tube with expansible ends and having a waisted portion along a predetermined length forming a housing for strain gauges.

The expansible ends of the tube comprise expansion bolts to give a non-slip pressure face contact with the inside face of the shaft on which torque measurements are required.

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**3,672,214**

**ROPE TENSION GAUGE FOR ELEVATOR SYSTEM**

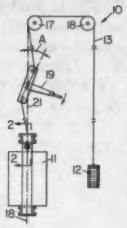
**Kentaro Yasuda, Bergenfield, N.J., assignor to Otis Elevator Company, New York, N.Y.**

**Filed Oct. 9, 1969, Ser. No. 865,048**

**Int. Cl. G01l 5/06**

**U.S. Cl. 73—144** **1 Claim**

A hoist rope tension gauge for an elevator system, including an elevator car, a counterweight, and a plurality of hoist ropes suspending said elevator car and counterweight, wherein said rope tension gauge is connected to one of said hoist ropes and is operative to measure the rope tension force in said hoist rope for comparison with the rope tension forces in the remaining hoist ropes for equalizing said forces, said rope tension gauge comprising an elongate bearing member having bearing portions disposed at opposite ends thereof for engaging opposite sides of spaced portions of said selected rope, a



torque wrench connected to said bearing member at a portion intermediate said bearing member ends for applying a torque to said bearing member for transmission to said selected rope, an angle indicator mounted on said bearing member for measuring the angle of displacement of said selected rope caused by the torque transmitted to said selected rope, and means for measuring the amount of torque applied to said selected rope by said bearing member.

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**3,672,215**

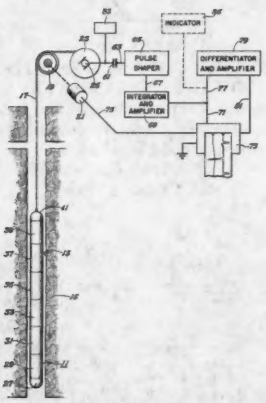
**APPARATUS EMPLOYING DIODE JUNCTION MEANS FOR MEASURING SUBTERRANEAN TEMPERATURES**

**Beauford F. Stout, Grandview, and George W. Hann, Fort Worth, both of Tex., assignors to Worth Well Surveys, Inc., Fort Worth, Tex.**

**Filed Sept. 8, 1969, Ser. No. 855,981**

**Int. Cl. F21b 49/00**

**U.S. Cl. 73—154** **4 Claims**




Apparatus for measuring temperatures and temperature anomalies along the longitudinal axis of a borehole penetrating subterranean formations characterized by a temperature sensor comprising a power supply and a temperature-compensated constant current regulator connected with at least one diode junction for flowing a constant current through the diode junction, the voltage drop across the diode junction varying linearly with temperatures over the range of 60°–350° F and linearly enough to be usable to temperatures as high as 400° F. In a specific disclosed embodiment, a unijunction

transistor generates, in response to the voltage drops across the diode junction, frequency-type signals which are sent to the surface; an integrator is provided for integrating the signals to effect an indication of temperatures; and a differentiator is provided for differentiating the output from the integrator to effect a differentiated temperature indication to delineate anomalies. The temperatures and differentiated temperature indications are ordinarily recorded with respect to depth. Specific structures of the diode junction and of the temperature-compensated constant current regulator are also disclosed.

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**3,672,216**

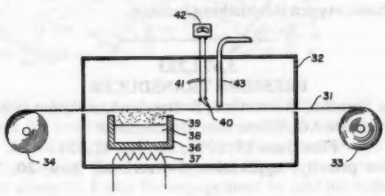
**MEASUREMENT OF TEMPERATURE OF A MOVING STRAND IN A VACUUM**

**Albin E. Schraeder, Pittsburgh, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 585,140, Oct. 7, 1966, abandoned. This application April 2, 1970, Ser. No. 25,242**

**Int. Cl. G01k** *1/16*

**U.S. Cl. 73—343 R** **6 Claims**




The temperature of a moving strand in a vacuum is measured by placing a thermocouple in sliding contact with the strand while supplying a gas inert to the strand to the thermocouple in the region of its contact with the strand.

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**3,672,217**

**COLOR THERMOMETER MEASURING DEVICE**

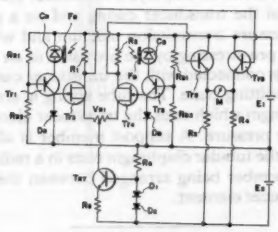
**Mikio Naya; Haruki Yamaguchi, and Izumi Horie, all of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha**

**Filed June 10, 1970, Ser. No. 45,125**

**Claims priority, application Japan, June 12, 1969, 44/46248**

**Int. Cl. G01j** *5/30*

**U.S. Cl. 73—355 EM** **5 Claims**



Two individual detecting circuits each of which detects a different spectral range and including a photovoltaic element and a transistor for providing an output signal proportional to the intensity of spectral energy incident on the photovoltaic element. Each output signal is modified by a diode and provided to an input of a differential amplifier composed of a pair of field effect transistors to provide an output representative of the ratio of the spectral energies. The differential amplifier output drives an indicating means to indicate the color temperature.

**3,672,218**

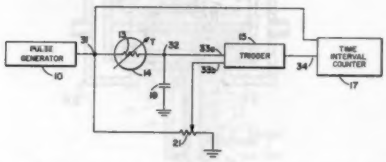
**SYSTEM FOR MEASURING TEMPERATURE OF A CRYOGENIC ENVIRONMENT**

**Richard L. Hartman, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army**

**Filed Jan. 26, 1971, Ser. No. 109,876**

**Int. Cl. G01k** *7/24, 7/34*

**U.S. Cl. 73—362 AR** **2 Claims**




A system for measuring the temperature of a cryogenic environment including an RC circuit provided with a source of reference voltage with a resistance sensor disposed within the environment and connected to a trigger. A pulser is connected to supply the RC circuit and a temperature indicator is connected to a pulser and trigger to count the RC interval for determination of the temperature of the environment.

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**3,672,219**

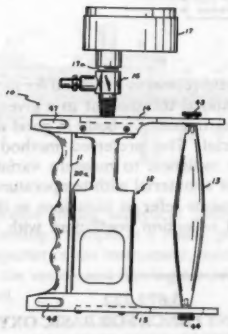
**ADJUSTABLE HYDRAULIC/ELECTRIC HAND GRIP DYNAMOMETER**

**Robert E. Van Patten, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force**

**Filed Nov. 12, 1970, Ser. No. 88,760**

**Int. Cl. G011** *5/02*

**U.S. Cl. 73—379** **8 Claims**

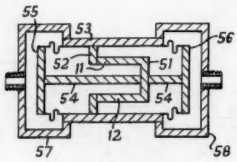


A hand-grip dynamometer having a main support element mounting front and back grip members in spaced relation on opposite sides thereof, and incorporating a hydraulic system interconnected with the front grip member and combined with a potentiometric pressure transducer for measuring a gripping force applied to the front grip member.

## 3,672,220
## FORCE-TRANSDUCERS

Joram Agar, Farnborough, England, assignor to The Solartron Electronic Group Limited, Farnborough, England

Division of Ser. No. 637,471, May 10, 1967, Pat. No. 3,529,470. This application Feb. 12, 1970, Ser. No. 14,877
Int. Cl. G01l 13/06
U.S. Cl. 73—398 R 3 Claims

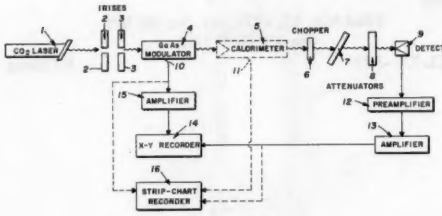



Force-measuring apparatus having a composite strut with two bars which are to be maintained in transverse vibration at a common resonance frequency by electrical feedback, the frequency of vibration indicating the force applied to the composite strut.

## 3,672,221
## TEMPERATURE SENSOR

Raoul B. Weil, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 19, 1969, Ser. No. 886,637
Int. Cl. G01k 11/12
U.S. Cl. 73—339 R 5 Claims



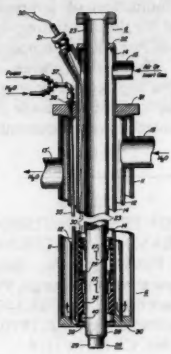

The disclosure herein relates to a method for monitoring the temperature of a material transparent to a given part of the electromagnetic spectrum or of a body in good thermal contact with the material. The preferred method referenced herein utilizes laser radiation to measure variations in the index of refraction of a material with temperature variations. Alternative embodiments refer to variations in the transmission coefficient and reflection coefficient with variation in temperature.

## 3,672,222
## INSTRUMENT LANCE FOR BASIC OXYGEN STEELMAKING FURNACE

Philip D. Stelts, Center Valley, and David W. Kern, Slatedale, both of Pa., assignors to Bethlehem Steel Corporation

Filed Dec. 16, 1970, Ser. No. 98,490
Int. Cl. G01k 1/10
U.S. Cl. 73—343 R 4 Claims

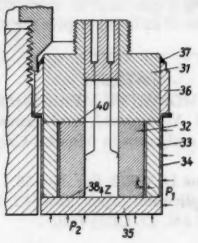
An instrument lance for introducing expendable immersion thermocouple devices into a molten steel bath contained in a basic oxygen steelmaking furnace. The instrument lance has means to introduce an inert gas and a fire retardant liquid against the outer surface of the thermocouple devices in order to prevent premature failure of the thermocouple elements as a result of the high temperature present in the heated interior of the basic oxygen steelmaking furnace.



## 3,672,223
## PRESSURE TRANSDUCER

Gelli A. Spescha, Winterthur, Switzerland, assignor to Kistler Instrumente AG, Winterthur, Switzerland

Filed June 19, 1970, Ser. No. 47,801
Claims priority, application Switzerland, June 20, 1969, 9553/69
Int. Cl. G01l 7/08
U.S. Cl. 73—406 12 Claims




A pressure transducer employs a transducer element which is supported on the transducer casing and on a plate which serves as a pressure transmission medium and which is subjected to axial pre-stressing by the provision of an elastic tube spring, which is connected with the transducer casing and the pressure transmitting plate. The tube spring is arranged on a tubular diaphragm which seals the transducer element against the measuring pressure. A support member is also provided against which the tubular diaphragm rests in a radial direction, the support member being arranged between the diaphragm and the transducer element.

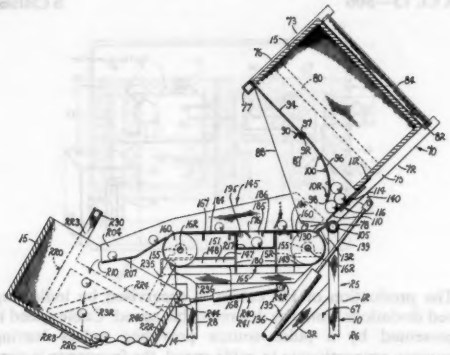
## 3,672,224
## ARTICLE SAMPLING APPARATUS

Ralph W. Starr, P.O. Box 576, Selma, Calif.

Filed Jan. 2, 1970, Ser. No. 372
Int. Cl. G01a 1/02
U.S. Cl. 73—421 R 11 Claims

An article sampling apparatus for obtaining a random sampling of articles such as fruits, vegetables and the like from relatively large produce transporting bins providing ding an elongated frame having a bin receiving end and an opposite bin discharging end including bin elevating and dumping

means disposed adjacent to said bin receiving end of the frame having an elevated position for dumping the articles in the bins onto an elongated article sampling member providing an intermittently opening article discharge slot for removing a sample of such articles therefrom prior to the discharge of the bulk of the articles from an opposite discharge end of the member and



tiltable bin reloading means mounted on the discharge end of the frame for positioning empty bins in article receiving relation to the discharge end of the sampling member with the bins emptied by the elevating and dumping means being movable along the frame for engagement by said bin reloading means.

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**3,672,225**

**GAS SAMPLING**

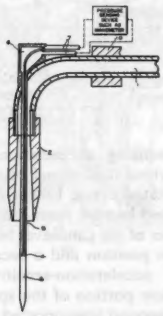
Rodney Brian Louis, Johannesburg, Republic of South Africa, assignor to African Explosives and Chemical Industries Limited

Filed Aug. 13, 1970, Ser. No. 63,528

Claims priority, application Republic of South Africa, Aug. 15, 1969, 69/5850

Int. Cl. G01l *13/00*; G01n *1/22*

U.S. Cl. 73—421.5 R 5 Claims



Apparatus for sampling fluid flow in a conduit comprising a sampling probe having an aerodynamically shaped nozzle and a double static tube axially located within the nozzle and extending beyond its mouth to terminate in a closed, aerodynamically contoured end, the outer wall of the extended portion of the tube being provided with first and second orifices to communicate with the bore of the tube and the annular passage of the tube remote from the extended portion operatively communicating with a pressure sensing device to sense the static pressure of the fluid flow outside the nozzle and the static pressure of the fluid flow entering the mouth of the nozzle.

**3,672,226**

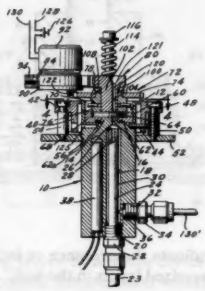
**CHROMATOGRAPH INLET WITH ROTATING SEPTUM**

John D. Reid, Monrovia, Calif., assignor to Hamilton Company, Whittier, Calif.

Filed Dec. 18, 1969, Ser. No. 886,142

Int. Cl. G01n *1/00, 31/08*

U.S. Cl. 73—422 GC 3 Claims



A septum inlet apparatus for chromatographs having a ported body and a septum disc carried by a rotatably mounted septum carrier driven by an electric motor through speed reduction gearing. The septum is rotatably moved a predetermined amount by operating the motor for a predetermined period of time to move a used portion of the septum out of operative position and bring into operative position an unused portion.

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**3,672,227**

**SAMPLE INJECTION ARRANGEMENT FOR AN ANALYTICAL INSTRUMENT**

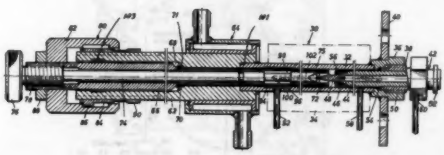
Peter Frank, Diasendorf/Meersburg/Bodensee; Dietrich Jentzsch, and Helmut Kurger, both of Uberlingen/Bodensee, all of Germany, assignors to Bodenseewerk Perkin-Elmer, Ulberlingen/Bodensee

Filed March 13, 1970, Ser. No. 18,378

Claims priority, application Germany, April 12, 1967, B 92023

Int. Cl. G01n *1/22, 1/28*

U.S. Cl. 73—422 GC 9 Claims



Sample injection in an analytical instrument comprises mechanically sealing a sample in a vessel, positioning the vessel within an injector of the instrument, mechanically forming an aperture in the vessel, and flowing a carrier gas through an apertured vessel.

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**3,672,228**

**METHOD AND APPARATUS FOR FORMING A SHALE CAKE AND MEASURING THE RESISTIVITY AND DENSITY THEREOF**

Harold L. Overton, 5418 Whispering Creek, Houston, Tex.

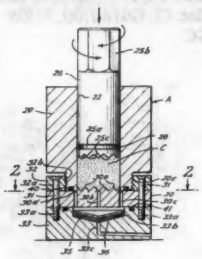
Filed June 22, 1970, Ser. No. 48,095

Int. Cl. G01n *27/12*

U.S. Cl. 73—432 R 7 Claims

Method and apparatus for forming a shale cake of a standardized volume from random samplings of shale cuttings obtained from a well, and wherein the electrical resistivity and

density of such shale cake is measured to thereby provide dependable objective data for analysis as to various conditions in



the well which indicate the presence or lack of petroleum formations and pressurized layers in the well.

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## 3,672,229
## APPARATUS FOR INDICATING ERRORS IN INCLINATION FOR INERTIAL NAVIGATION

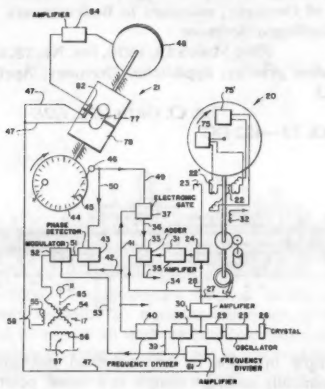
**Carl-Erik Granqvist, Lidingo, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden**

**Continuation-in-part of Ser. No. 467,182, June 11, 1965, abandoned, which is a continuation-in-part of Ser. No. 169,538, Jan. 29, 1962, abandoned. This application July 13, 1967, Ser. No. 653,075**

**Claims priority, application Sweden, Feb. 6, 1961, 1200/61**

**Int. Cl. G01p *15/14***

**U.S. Cl. 73—504** **5 Claims**




An inertial navigation and guidance system includes a gyroscope and accelerometer mounted on a platform for establishing a common normally horizontal plane. The gyroscope is precessed at a constant rate and a pulse signal is produced whose frequency varies in accordance with the deviation of the platform from the horizontal. An electronic gate compares the pulse signal with a constant frequency reference signal. A further pulse signal is produced in response to the accelerational forces acting on the accelerometer in the common plane. This latter pulse signal is applied together with the output of the gate and with a constant frequency reference signal to an adder which provides an output signal related to the acceleration of the system.

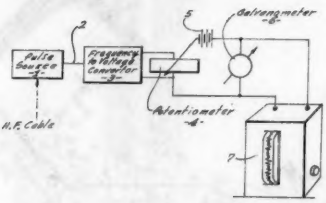
## 3,672,230
## METHOD AND APPARATUS FOR TESTING PRODUCTION OF HIGH FREQUENCY CABLES

**Wolfram Klebl, An Der Beeke, Germany, assignor to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany**

**Filed Jan. 12, 1970, Ser. No. 2,056**

**Int. Cl. G01p *3/48***

**U.S. Cl. 73—506** **8 Claims**




The production of HF cables is supervised by indicating speed deviations from the desired cable speed. Cable speed is represented by a pulse source providing pulses leaving frequency proportionate to cable speed, the frequency is converted into a voltage to be compared with a reference for indicator control.

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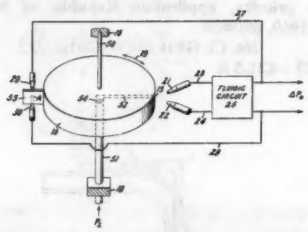
## 3,672,231
## CLOSED-LOOP FLUIDIC ANALOG ACCELEROMETER

**Jeffrey N. Shinn, and Carl G. Ringwall, both of Scotia, N.Y., assignors to General Electric Company**

**Division of Ser. No. 642,115, May 29, 1967. This application July 18, 1969, Ser. No. 862,110**

**Int. Cl. G01p *15/02***

**U.S. Cl. 73—515** **4 Claims**

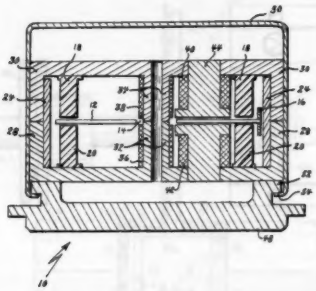



Apparatus for sensing acceleration and generating an analog-type pressurized fluid signal proportional to the magnitude of the associated event. Linear acceleration as sensed by a flexure-mounted inertial mass including a hollow, elongated spring member of the cantilever beam type having a first end rigidly fixed in position and a second unsupported end upon which the acceleration-sensitive inertial mass is mounted. The hollow portion of the spring member issues a fluid jet from the second unsupported end directed at fluid receivers, the flexure of the spring member causing distribution of the jet between the receivers in proportion to the magnitude of the acceleration. Fluid amplifier circuitry provides high gain and stabilization in the loop comprising the spring-mass device, receivers, fluid amplifier circuitry and a negative feedback circuit to obtain closed-loop null-type operation producing insensitiveness to changes in pressure of the fluid supplied to the hollow spring member. Angular motion acceleration is sensed by utilizing a cylindrical inertial mass connected along its longitudinal axis to two torsional spring members rigidly fixed in position at their far ends such that the cylindrical mass is subject to rotation in the presence of an angular motion acceleration.

## 3,672,232
## TWO AXIS GAS BEARING ACCELEROMETER

Kurt A. Marggraf, Tonawanda, and Ernest Metzger, Eggertsville, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force

Filed June 2, 1970, Ser. No. 42,647
Int. Cl. G01p *15/08*
U.S. Cl. 73—516 R 1 Claim

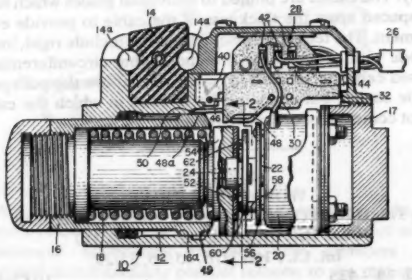


A new type of rugged two axis gas bearing accelerometer wherein the gas bearing is piezo-electrically actuated, the mass sensor is a simple flat metal washer which is suspended between two sets of piezo-electric ceramic parts, the pick off is a conventional capacitance pick off and the forcer principle is electro-dynamic.

## 3,672,233
## ACTUATOR MECHANISM

Hans U. Hjermstad, Chicago, and Carl J. Kopp, Arlington Heights, both of Ill., assignors to C. P. Clare & Company

Filed July 6, 1970, Ser. No. 52,513
Int. Cl. G05g *17/00*
U.S. Cl. 74—2 6 Claims

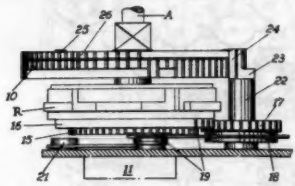


An electro-mechanical actuator comprises a housing defining a cylindrical chamber for receiving a plunger which is movable between an energy-storing, cocked position and a released position. Release is effected by momentary energization of a rotary armature of a solenoid in response to an electrical signal pulse. A latch arm of a slidable switch member is normally captivated by the plunger but is released upon its displacement thereby to permit movement of the slidable switch member. A locking means coupled to the rotary armature of the solenoid is movable on release of the plunger to captivate the latch arm until power is removed from the solenoid.

## 3,672,234
## RAPID-RELEASE ESCAPEMENT FOR TIMING PROGRAMMERS

Renato Gazzani, Frosinone, Italy, assignor to O.M.P. Officine Meccanoplastiche Di Precisione S.R.L., Frosinone, Italy

Filed Sept. 30, 1970, Ser. No. 76,894
Claims priority, application Italy, Oct. 4, 1969, 40523 A/69
Int. Cl. G05g *21/00*
U.S. Cl. 74—3.52 6 Claims

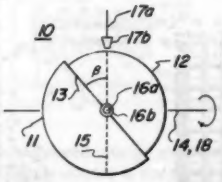


Reduction gearing driven by a motor drives a toothed transmission wheel. A toothed advancement wheel is driven by the toothed transmission wheel and is provided with an axial pin having a short longitudinal nib, and a long longitudinal nib located diametrically opposite to the short nib. An output wheel has two partial rings of teeth one of which is in driven alignment with the short nib and both of which are in driven alignment with the long nib. A dwell wheel is coaxial with and has a lost motion connection with the output wheel, and has a partial ring of teeth in driven alignment with the long nib.

## 3,672,235
## FLUIDIC AXIS POSITION SENSOR FOR ROTATING MASS

Carl G. Ringwall, Scotia, N.Y., assignor to General Electric Company

Filed Feb. 18, 1970, Ser. No. 12,241
Int. Cl. G01c *19/28*
U.S. Cl. 74—5.6 7 Claims



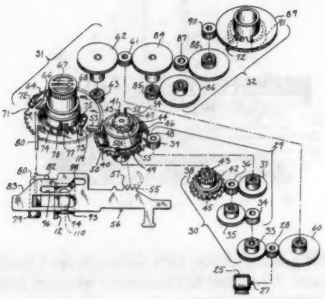
A fluidic axis position sensor is disclosed wherein the axis of rotation of a rotating mass may be determined by sensing irregularities on the surface of the rotating mass. The surface irregularities induce pressure changes in the ambient fluid which may then be sensed. The specific embodiment disclosed relates to a gyroscopic rotor formed by joining hemispheres of differing diameters. Upon rotation about an axis not having as an equator the discontinuity formed by the joint, the discontinuity induces pressure variations which are sensed by fluidic pickoffs spaced about the rotating mass. The output of each pickoff is a pulse width modulated signal whose duty cycle is used to determine the position of the axis of rotation of the mass.

**3,672,236**

## MECHANICAL RECIPROCATOR

David G. Prosser, Mequon, Wis., assignor to Autotrol Corporation, Milwaukee, Wis.

Division of Ser. No. 818,763, April 23, 1969, Pat. No. 3,574,330. This application Sept. 2, 1970, Ser. No. 69,058
Int. Cl. F16h *19/04*
U.S. Cl. 74—32 4 Claims



A reciprocating member is alternately engaged to be driven first in one direction by an arcuate rack and in the opposite direction by a pinion both of which are power actuated from a common source.

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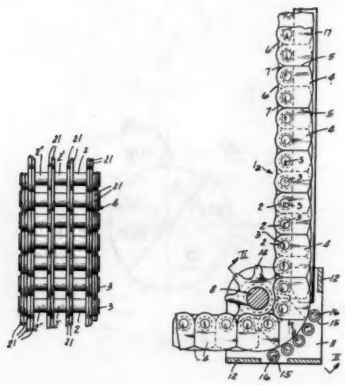
**3,672,237**

## LOAD SUPPORTING CHAIN AND SPROCKET SUPPORTING STRUCTURE THEREFOR

Tony Nagin, 14016 South Indiana Avenue, Chicago, Ill.

Filed Sept. 29, 1969, Ser. No. 861,582
Int. Cl. F16h *27/02*
U.S. Cl. 74—89.21 6 Claims



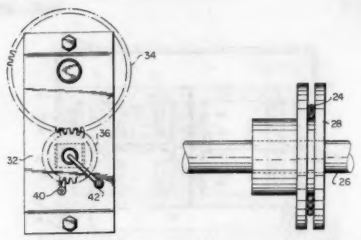
A compression chain arrangement comprising a plurality of roller chain links having connecting plates which have a configuration such that the connecting plates abut end to end when the chain is disposed along a straight line to provide a structure that is rigid in such line, but permit the chain to flex in one direction transverse to such line but not in the opposite direction, said chain being meshed with the teeth of a sprocket disposed at the side of the chain which will permit flexing of the latter about the sprocket, the outermost edges of the roller connecting plates being arcuate in shape and disposed, as they pass around the sprocket, in an arc concentric with the sprocket axis, means being disposed adjacent to and engageable with the concentrically positioned edges for guiding said plates as they pass around the sprocket.

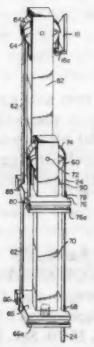
**3,672,238**

## EXTENDABLE AND RETRACTABLE SUPPORTS

Charles H. Young, Elkhart, and Donald L. Ray, South Bend, both of Ind., assignors to Ski-Tow Manufacturing Co., Elkhart, Ind.

Filed Feb. 18, 1970, Ser. No. 12,387
Int. Cl. F16h *27/62*
U.S. Cl. 74—89.2 20 Claims





An extendable and retractable support system for raising and lowering the top of a vehicle in which telescope assemblies at the four corners are connected by cables to a winch assembly. The cables are pinned to individual guides which have slots spaced apart the thickness of the cable to provide even movement. The telescope assemblies each include rigid, internal rods with pulleys near the end having circumferentially disposed cable hoods carried by the rods above the pulleys to provide strong, but economic assemblies in which the cable will not come out of operative position.

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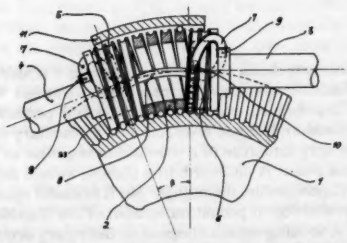
**3,672,239**

## WORM GEAR DRIVE

Georg Titt, D-8358 Obere Vorstadt 9, Vilshofen, Germany

Filed Dec. 21, 1970, Ser. No. 100,317
Int. Cl. F16h *1/16, 55/06, 55/22*
U.S. Cl. 74—425 10 Claims

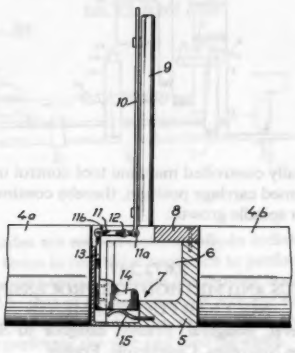


A worm gear drive in which a worm coil is curved along the periphery of a worm wheel and has convolutions formed with peripheral grooves which receive rolling bodies which mesh with teeth at the periphery of the worm wheel.

## 3,672,240
## HAND BRAKES IN MOTOR VEHICLES

Albert A. G. Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Jan. 15, 1970, Ser. No. 3,018
Claims priority, application France, Jan. 22, 1969, 6901111
Int. Cl. G05g 1/10
U.S. Cl. 74—503 4 Claims

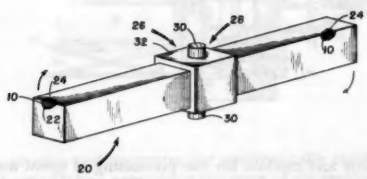


A device for controlling the brakes of a vehicle including a handle mounted in a housing in the dashboard such that its outer surface is flush with the dashboard when the handle is in one position of operation.

## 3,672,241
## FILAMENT ROTOR STRUCTURES

David W. Rabenhorst, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed July 31, 1970, Ser. No. 60,047
Int. Cl. F16c 15/00
U.S. Cl. 74—572 26 Claims



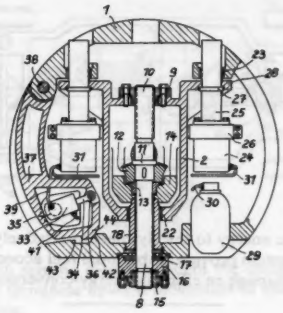
A rotational energy storage device comprising in its basic form a rotor or "flywheel" structure constructed of straight anisotropic filamentary members, the members being disposed in substantially parallel relation to the major stress component acting on the structure. Each filamentary member is essentially loaded along its longitudinal axis, thereby permitting maximum utilization of high strength-to-density uniaxial properties of the member.

## 3,672,242
## CRANK WITH ADJUSTABLE CRANK RADIUS

Manfred Fritz, Erkrath, Germany, assignor to Schloemann Aktiengesellschaft, Dusseldorf, Germany

Filed June 29, 1970, Ser. No. 51,744
Claims priority, application Germany, June 28, 1961, P 19 33 008.6
Int. Cl. F16c 3/28
U.S. Cl. 74—600 8 Claims

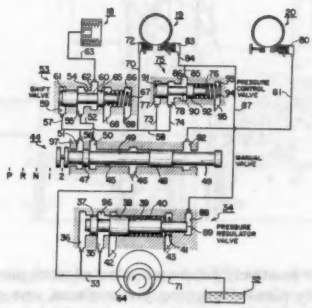
In adjustable throw cranks, it is desirable to take up any play in the mechanical adjusting mechanism. The play is taken up using a pressure fluid thrusting device which thrusts the crank pin towards the axis of rotation of the crankshaft. This is particularly useful in flying shears where the force of the shear blade is opposed to centrifugal force.



## 3,672,243
## FLUID PRESSURE CONTROL MECHANISM

Noboru Murakami, and Koichiro Hirozawa, both of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya Aichi Pref., Japan

Filed June 1, 1970, Ser. No. 42,420
Claims priority, application Japan, May 30, 1969, 44/42839; June 21, 1969, 44/49249
Int. Cl. F16h 3/74, 5/42; B60k 21/00
U.S. Cl. 74—753 4 Claims



In a fluid operated speed change mechanism the hydraulic pressure from a supply source is subjected to a pressure adjustment by a suitable control valve and is selectively supplied to a fluid motor which controls the engagement of a brake band in the planetary gearing. The reaction force caused by engagement of the brake band is transmitted mechanically or fluidically to the pressure adjusting control valve in a manner to increase the fluid pressure being supplied to the fluid motor thereby increasing the braking force of the brake band to prevent undue slippage. When the brake band is not applied, no reaction force can be transmitted to the control valve and the control valve will function in the normal manner.

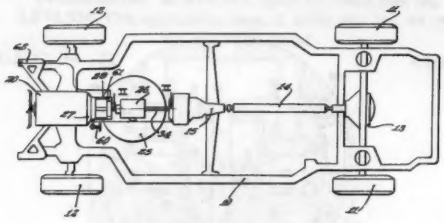
## 3,672,244
## FLYWHEEL AUTOMOTIVE VEHICLE

Algirdas L. Nasvytis, 10823 Magnolia Drive, Cleveland, Ohio

Filed April 8, 1970, Ser. No. 26,713
Int. Cl. B60k 21/00; F16h 3/74
U.S. Cl. 74—859 5 Claims

An automotive system employing a high velocity, moderate mass flywheel capable of storing and rapidly dissipating large

supplies of kinetic energy coupled with a transmission adapted to permit the smooth release of stored kinetic energy from the flywheel to the vehicle wheels, and a charging means for supplying kinetic energy to the flywheel at relatively low energy levels. The system provides substantial fuel economy and pollution relief through an efficient energy-conversion system.



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**3,672,245**

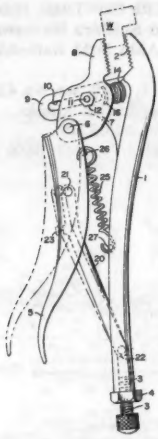
**WRENCH**

**Charles F. Hoffman, 11850 Mayfield Road, Chardon, Ohio**

**Filed March 15, 1971, Ser. No. 124,071**

**Int. Cl. B25b** *7/12, 7/04*

**U.S. Cl. 81—367** **2 Claims**



Pliers for positively gripping a selected work piece between substantially parallel gripping jaw surfaces, one of which is carried by a fixed handle, the other of which is carried by a pivoted toggle member mounted on an extension of the fixed handle for pivotal movement and adjustment toward and away from the jaw on the fixed handle, a handle pivotally connected to the toggle member and tensioning means connecting said handles and adjustment means on the fixed handle and having pivotal connection with the pivoted handle whereby the gripping effort on a selected work piece may be adjusted to secure a strong positive grip thereon without causing damage to the work piece.

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**3,672,246**

**AUTOMATIC SPINDLE GROWTH COMPENSATION SYSTEM**

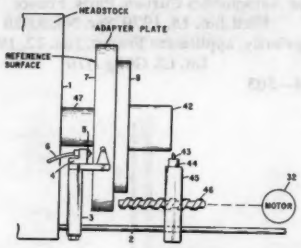
**Hubert P. Prewett, Jr., and Charles H. Thompson, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission**

**Filed April 20, 1970, Ser. No. 29,925**

**Int. Cl. G05d** *23/275;* **B23b** *23/06*

**U.S. Cl. 82—2 B** **5 Claims**

A numerically controlled lathe is provided with a spindle growth compensator which continuously monitors the spindle growth using a displacement sensing device with a linear electrical output signal. The signal is them modified and used in the numerically controlled machine tool control unit to offset the programmed carriage position, thereby continuously compensating for spindle growth.

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**3,672,247**

**APPARATUS AND METHOD FOR PROCESSING SPENT NUCLEAR FUEL ELEMENTS**

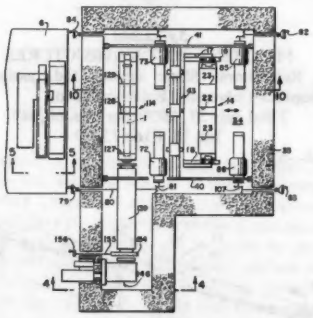
**Guy H. Cherel, Bougival, France, assignor to Saint-Gobain Techniques Nouvelles, Courbevoie, France**

**Filed June 19, 1968, Ser. No. 738,336**

**Claims priority, application France, June 19, 1967, 67110858**

**Int. Cl. B26d** *1/08, 1/52, 7/02*

**U.S. Cl. 83—35** **29 Claims**



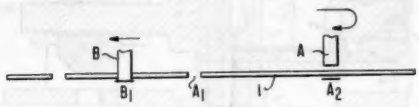
Apparatus and method for the processing of spent nuclear elements preparatory to reconditioning the nuclear fuel thereof. Each element is, in turn, elevated on a truck moving along an inclined track, from a storage chamber to an enclosure wherein it is automatically transferred to a crane supported for movement horizontally in a direction normal to the length dimension of the element. Moving with the crane, the element is transported to and between two spaced sawing or abrasive cutting devices where its inert ends are cut off and collected. The element, sans ends, continues movement on and with the crane, to a table on which it is deposited. The crane returns to initial position. Mechanism incorporated in the table translates the element in the direction of its length to a shear wherein it is cut into fragments of relatively short length. The fragments are accumulated into batches and each batch is released in turn, for gravity drop into a tank of solvent for the nuclear fuel. A number of such tanks are provided and mechanism enables each batch to be directed, as desired, into a selected one of the tanks. All operating parts are completely shielded and controlled from remote stations exteriorly of the shielded enclosure. The invention eliminates a number of apparatuses, including panniers, necessary with prior art devices of like purpose.

3,672,248

## METHOD OF CONTINUOUSLY PERFORATING A WEB AND APPARATUS FOR THE SAME

Kimiaki Tsujimura, and Tosio Moriya, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed April 9, 1970, Ser. No. 26,996
Claims priority, application Japan, April 19, 1969, 44/30489
Int. Cl. B26f 1/06
U.S. Cl. 83—37 3 Claims



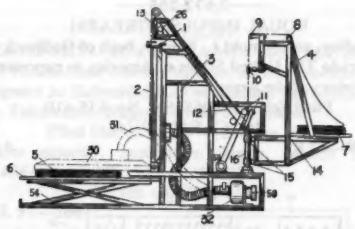

Cutter blades are moved downwardly in individual fashion at different times in repetitive sequence to perforate the web, while at the same time the blades are moving horizontally at a speed equal to that of the moving web with the blade projecting through the web driving the same. Thus, the individual blades both perforate the web and feed the same.

3,672,249

## PROCESS AND APPARATUS FOR AUTOMATIC CUTTING AND PILING OF KNITTED FABRICS

Tadajiro Sasaki, Osaka, Japan, assignor to Kabushiki Kaisha Sasakiseisakusho, Osaka, Japan

Filed June 11, 1970, Ser. No. 45,446
Int. Cl. B65h 29/32
U.S. Cl. 83—80 5 Claims



A process and apparatus for automatically cutting and piling knitted fabric comprising the steps of successively drawing a long continuous tubular knitted fabric creased in both side edges and folded in a longitudinal direction, maintaining the creased edges or moving same to the center, conveying the fabric slowly upward and forward, hanging the fabric, stopping the hanging at a predetermined length, attracting the fabric at a stop position, cutting the fabric at its top, shifting the attracted fabric to a piling stand, and piling the fabric successively after releasing it from attraction.

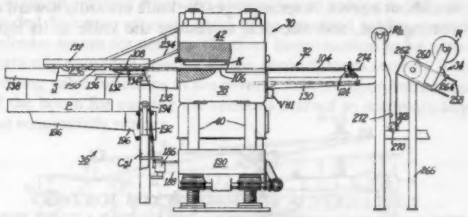
3,672,250

## CUTTING PRESS HAVING IMPROVED MEANS FOR HANDLING CUT PRODUCT

David F. Creffield, Bristol, England, assignor to USM Corporation, Boston, Mass.

Division of Ser. No. 682,953, Nov. 14, 1967, Pat. No. 3,527,132. This application April 27, 1970, Ser. No. 48,567
Int. Cl. B65h 31/10
U.S. Cl. 83—92 5 Claims

A cutting press having a beam and a bed arranged for relative movement of approach and separation is provided with improved means for handling the cut product. The product handling means includes a product feed table and a stacking device having a vertically movable table and control means operative in response to engagement of the upper surface of



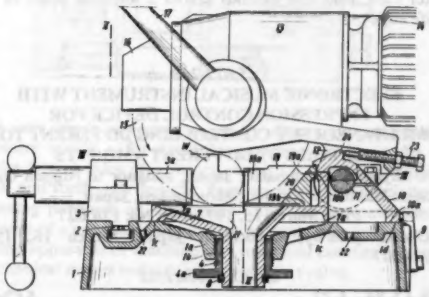
the stack with sensing means adjacent the under side of the feed table to terminate upward movement of the table of the stacking device.

3,672,251

## SAW

Leopold Jagers, Rudolf-Diesel-Str.-1, 535 Euskirchen/Rhineland, Germany

Continuation-in-part of Ser. No. 20,852, March 18, 1970, abandoned. This application Oct. 5, 1970, Ser. No. 77,825
Claims priority, application Germany, Oct. 7, 1969, P 19 50 512.5; March 19, 1969, P 19 13 833.1
Int. Cl. B23d 47/02, 45/04
U.S. Cl. 83—169 15 Claims



A saw comprising a base plate 1 (FIG. 1), a disc 7 rotatably mounted on the base plate; clamping means disposed over the disc 7 and comprising forward elements 3, 3*a* and a backstop element composed of arms 18*a*, 18*b* (FIG. 2), and the arcuate member 19 joining the said arms, said clamping means being disposed over the disc 7, and a saw assembly 13, 14, 15, 16, 17 pivotally mounted on the machine via pin 11 (FIG. 1). The arcuate member 19 of the backstop is in bearing relation with the mount of the saw assembly adjacent the upper level of the arcuate member 19*a*, 19*b*. To accommodate different size workpieces, an auxiliary backstop 28 (FIG. 4) is provided to permit positioning a small workpiece in a more forward position with respect to the path of the saw blade, permitting more effective operation of the saw.

3,672,252

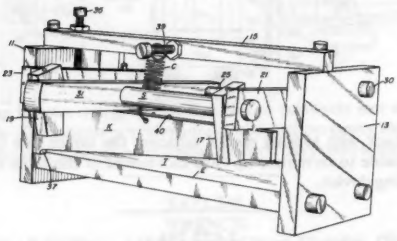
## APPARATUS FOR SEVERING A SHEET

Willard G. Symonds, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 18, 1970, Ser. No. 90,501
Int. Cl. B26d 5/10
U.S. Cl. 83—582 11 Claims

Apparatus for severing a sheet of material such as photographic film or paper, comprising a plane table having a

cutting edge; a knife movable into and out of shearing relationship with the cutting edge; a shaft supporting the knife and having a longitudinal axis spaced ahead of the cutting edge outboard thereof, the knife being pivotally movable about said axis; and levers for supporting the shaft for movement in an arc about a pivot. A spring urges the knife inwardly toward the cutting edge, and also acts to restore the knife to its initial



position after each cutting operation. Advantageously the spacing of the shaft ahead of the cutting edge is such that a first plane through the shaft axis and a line along the cutting edge forms an acute angle of 10°–15° with a second plane through said line and normal to the plane table. The principles apply to cuts straight across a sheet, and to oblique cuts (in the latter case, said line extends across a terminal point of the knife edge).

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**3,672,253**

## ELECTRONIC MUSICAL INSTRUMENT WITH EXPRESSION CONTROL DEVICE FOR SIMULTANEOUSLY CONTROLLING DIFFERENT TONE SIGNALS BY DIFFERENT AMOUNTS

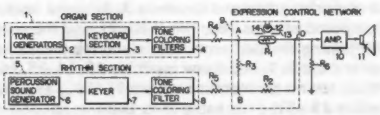
**Ryu Hiyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka-ken, Japan**

**Filed March 15, 1971, Ser. No. 124,027**

**Claims priority, application Japan, March 16, 1970, 45/24807**

**Int. Cl. G10h *1/02***

**U.S. Cl. 84—1.27** **5 Claims**




An electronic musical instrument includes two different music part playing sections such as an organ section and a rhythm section. The tone signal from the organ section is applied to an amplifier followed by a loudspeaker through a variable resistor for expression control, while the tone signal from the rhythm section is applied to the amplifier through a resistor having a resistance higher than the minimum resistance of the variable resistor and lower than the maximum resistance of the same. The input sides of both resistors are shunted by another resistor having a resistance comparable with the output impedance of the playing sections. When the variable resistor is operated, the rhythm section signal is subjected to volume control of a narrower range than the organ section signal.

**3,672,254**

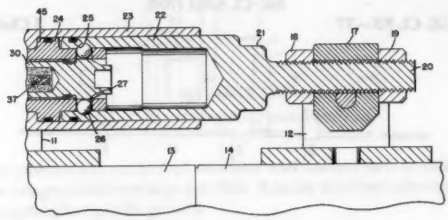
## CARTRIDGE ACTUATING DEVICE

**Bruce W. Travor, Holland, and Lennord L. Pitney, Levittown, both of Pa., assignors to The United States of America as represented by the Secretary of the Army**

**Filed June 8, 1970, Ser. No. 44,470**

**Int. Cl. F42b *25/16*; B64d *1/04***

**U.S. Cl. 89—1 B** **2 Claims**



A cartridge actuated bomb release mechanism or assembly in which malfunctioning is eliminated with the provision of a positive disconnect between the delay element body of the cartridge and the released forward plug that initially held ball detents in a locking relationship between wall openings of the cartridge chamber and the internally grooved piston sleeve to which a hatch opening block and bracket are attached or secured.

By providing a 360° crimp in the cartridge case at the delay body peripheral groove, an O-ring positioned in the crimped area will seal the cartridge chamber and retain the delay body from interfering with release of the ball detents after initiation and forward movement of the plug member.

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**3,672,255**

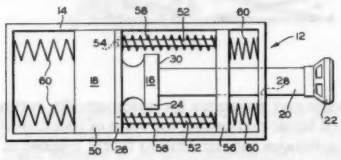
## EQUAL IMPULSE FIREARM

**David Findlay, and Arnold L. Fowler, both of Guilford, Conn., assignors to The United States of America as represented by the Secretary of the Army**

**Filed Feb. 23, 1965, Ser. No. 435,410**

**Int. Cl. F41f *19/14***

**U.S. Cl. 89—42 R** **4 Claims**

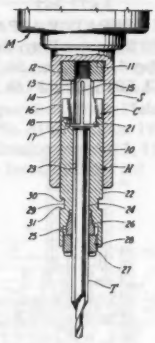


A gun including a receiver, a barrel assembly slidingly mounted in said receiver, a chamber in a barrel of said barrel assembly for receiving a cartridge with a base for discharge, a bolt slidingly mounted in said receiver for longitudinal displacement respective to said receiver and said barrel assembly and arranged to receive a rearward impulse by said cartridge when discharged, cooperating means in said cartridge and barrel assembly for imparting thereto a forward impulse equal to the rearward impulses received by said bolt through said base, and mechanical means for applying the impulses in said bolt and barrel assembly each against the other while under the urgings of such impulses to produce a zero velocity respective to each other and to said receiver, said mechanical means including a forward face on said barrel assembly, a stop plate and means for mounting said stop plate to said bolt so as to contact said forward face for stopping relative displacement between said bolt and barrel assembly responsive to discharge of the cartridge when said bolt is displaced to an open position relative to said barrel assembly.

## 3,672,256
## CENTRIFUGAL CHUCK DEVICE

Wojciech B. Kosmowski, Covina, Calif., assignor to Advanced Controls Corporation, Pico Rivera, Calif.

Filed Nov. 9, 1970, Ser. No. 87,992
Int. Cl. B23c 5/26; B23b 31/04
U.S. Cl. 90—11 A 11 Claims

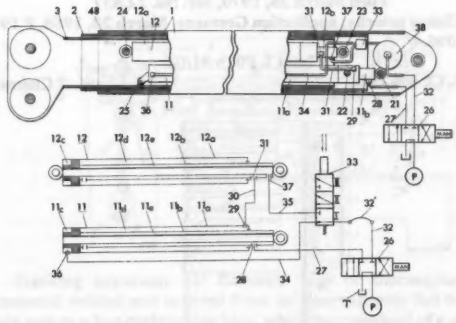


Centrifugal force responsive means for holding a tool in the bore of a spindle, in which the tool is carried by a tool holder insertable into and removable from the spindle bore, the tool holder having an inner end provided with a cavity, and a chuck being disposed in the spindle bore and having spring fingers, the ends of which engage in the cavity of the tool holder to initially hold the tool holder in the spindle, and the gripping action of the chuck fingers is increased by centrifugal force.

## 3,672,257
## EXTENSION MEANS OF A MULTI-STAGE BOOM

Tadao Yunoki, and Toshio Fujiyasu, both of Oh-Machi, Japan, assignors to Kabushiki Kaisha Tadano Tekkosho, Shindencho, Takamatsu, Kagawa Prefecture, Japan

Filed March 16, 1970, Ser. No. 19,717
Claims priority, application Japan, March 20, 1969, 44/21406; March 17, 1969, 44/20283
Int. Cl. F75b 11/18
U.S. Cl. 91—168 10 Claims

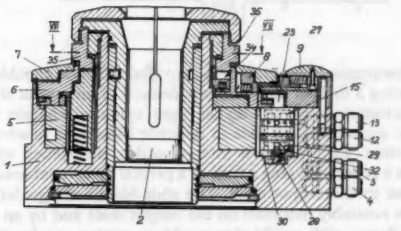


A multi-stage boom having at least three telescopic sections extendible and retractable relative to one another. A first cylinder means coacts between first and second boom sections for permitting relative movement therebetween, and a second cylinder means coacts between second and third boom sections for permitting relative movement therebetween. A fluid pressure control system is connected to the cylinder means for permitting the boom sections to be sequentially automatically extended or retracted. The control system includes a switching valve which, during extension of the boom, initially supplies pressure fluid to the first cylinder means to cause extension of the second boom section. The switching valve is automatically shifted when the second boom section is fully extended to cause pressure fluid to be supplied to the second cylinder means for causing the third boom section to be automatically extended relative to the second boom section. The shifting valve functions in the reverse manner upon retraction of the boom for causing the sections thereof to automatically but sequentially retract.

## 3,672,258
## CONTROL MECHANISM FOR ALTERNATELY APPLYING A PRESSURE MEDIUM UPON THE OPPOSITE LATERAL SIDES OF A ROTARY PISTON

Franz Spindelberger, Zurich-Hongg, Switzerland, assignor to E. Heiss-Thurow, Zurich, Switzerland

Filed Oct. 8, 1969, Ser. No. 864,792
Claims priority, application Germany, May 13, 1969, P 19 24 402.1
Int. Cl. F15b 11/15
U.S. Cl. 91—355 8 Claims

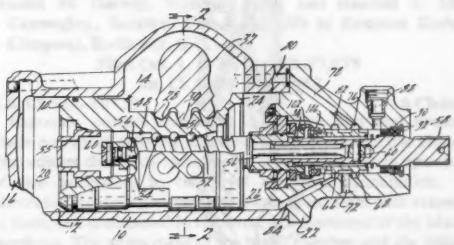


A very simple servomechanism for alternately conducting a pressure medium, for example, compressed air, to the opposite lateral sides of a rotary piston for turning this piston back and forth over specific angular distances especially for indexing purposes on a machine tool. The servomechanism consists of a valve unit which may be easily mounted in an indexing apparatus or machine tool itself and consists of simple mechanical means including a rotary servo valve.

## 3,672,259
## PRESSURE DISTRIBUTOR VALVE CONSTRUCTION FOR POWER STEERING GEAR MECHANISMS

James J. Duffy, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 17, 1970, Ser. No. 90,304
Int. Cl. F15b 9/10
U.S. Cl. 91—382 8 Claims



A valve mechanism for controlling pressure distribution to a fluid pressure operated servo motor in a power steering gear mechanism for an automotive vehicle comprising a simplified valve spool, a driver operated steering shaft, a relatively fric-

tion-free screw mechanism adapted to connect the steering shaft to driven portions of a steering system, the steering shaft including a torsion bar portion that yields upon application of steering effort to the steering shaft, a cam having a driving part connected to the steering shaft and a driven part connected to the valve spool for adjustably positioning the valve spool in response to deflection of the torsion bar portion, and a valve spring biasing the valve spool against the cam surface of said cam connection thereby establishing a zero backlash condition.

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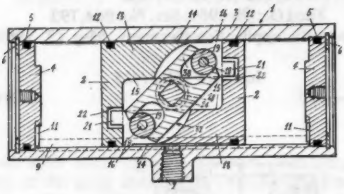
3,672,260

## COMPRESSED-AIR ACTUATOR

Jean Gachot, 179 Avenue de la Division Leclerc, 95 Enghien, and Fernand Perales, 87 Avenue A. G. Belin, 95 Argenteuil, both of France

Filed Dec. 14, 1970, Ser. No. 97,928
Int. Cl. F01b 7/02
U.S. Cl. 92—69 10 Claims



A compressed air actuator is provided which is capable of producing a limited angular displacement of an output shaft. The actuator comprises an air tight cylinder wherein two pistons are adapted to slide in opposite directions relative to each other. Each piston is integral with a slide-block which carries a roller engaging a fork of a pivotal lever mechanically coupled to the output shaft. The slide-blocks are guided by sleeves rotatably mounted on the output shaft and by an end guide flange with antifriction packings resting on the inner wall of the cylinder. Each slide-block carries an end guide lug capable of being received in a cavity of the opposite piston when the two pistons come close to each other.

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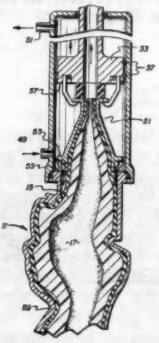
3,672,261

## APPARATUS FOR REMOVING FOAM BODIES FROM MOLDS

Jack H. Malek, Palos Verdes Peninsula, and Trevor Dawson, Hermosa Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 26, 1969, Ser. No. 880,315
Int. Cl. F01b 9/00
U.S. Cl. 92—137 9 Claims



A device and method for removing foam bodies from molds which comprises an air cylinder for attachment to the mold, the air cylinder having a slidable piston therein, and clamp means associated with the piston for affixing to a portion of the mold or molded body to pull the body from the mold into the cylinder. Means is provided for communicating an inner cavity of the molded body with atmospheric pressure or vacuum, and means is provided for admitting pressurized gas to the mold to compress the foam body therein, facilitating withdrawal.

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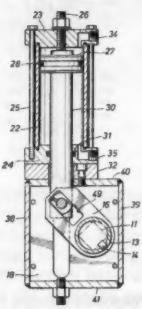
3,672,262

## VALVE OPERATOR APPARATUS

Michael A. Karr, 9353 Rosstown Way, Houston, Tex.

Filed May 4, 1970, Ser. No. 34,153
Int. Cl. F01b 9/00; F16h 21/54
U.S. Cl. 92—140 3 Claims



A pressure responsive valve operator which rotates a valve stem and which includes a piston connected with a piston rod. The piston rod carries a pin at its free end which is connected to a pair of yoke members on opposite sides of the piston rod. The connection is made by the use of sliding blocks in slots in the yoke members. Lateral forces on the piston rod are avoided by extending the ends of the connective pin into slots of a surrounding housing, there being sliding blocks in those slots which take up the lateral forces on the piston rod. The avoidance of lateral loading on the piston rod materially reduces the expense of the equipment in the elimination of oil seals, bearings, and the like.

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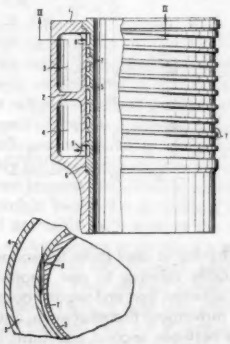
3,672,263

## CYLINDER BLOCK FOR LIQUID-COOLED INTERNAL COMBUSTION ENGINES WITH INSERTED CYLINDER LINER

Milorad Mirjanic, Im Vogelsang, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed March 26, 1970, Ser. No. 22,837
Claims priority, application Germany, March 28, 1968, P 19 16 096.4
Int. Cl. F01b 31/08
U.S. Cl. 92—144 7 Claims



A cylinder block for liquid-cooled internal combustion engines which has an inserted cylinder liner whereby a possibly

multiple grooving for the guidance of the cooling liquid is arranged in spiral shape between the outer surface of the cylinder liner and the inner surface of the cylinder block receiving the same; the grooving extends preferably with a relatively small pitch from an inlet to an outlet and extends either over the entire height of the cylinder liner or over only a part thereof.

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**3,672,264**

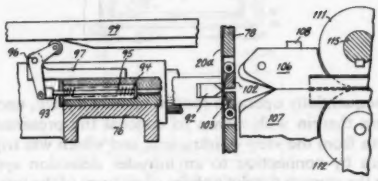
**POUCH FORMING MECHANISM**

**George M. Woodruff, Nyack; Oscar W. Stoeckli, Rye, both of N.Y., and Joseph G. Shando, Dover, Del., assignors to General Foods Corporation, White Plains, N.Y.**

**Division of Ser. No. 610,367, Jan. 19, 1967, Pat. No. 3,513,618. This application March 12, 1970, Ser. No. 26,467**

**Int. Cl. B31b** *1/28*

**U.S. Cl. 93—12 R** **5 Claims**



A mechanism for forming a pouch from a blank of web material includes a rectangular forming plunger provided with tucking fingers and operates to shape the blank into a pouch structure having a flat bottom and flat sides. The plunger is reciprocally driven between side edge folders and the tucking fingers form gusset flaps in the side edges of the blank during the advance of the blank to the folders.

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**3,672,265**

**APPARATUS FOR STACKING FLATTENED BAGS OF THERMOPLASTIC MATERIAL WHICH ARE MADE IN A BAG-MAKING MACHINE**

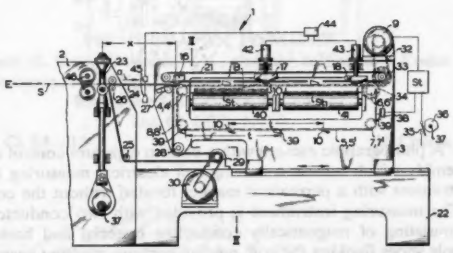
**August Schwarzkopf, Heinestrabe, Germany, assignor to Windmoller & Holscher, Westphalia, Munsterstrasse, Germany**

**Filed March 2, 1971, Ser. No. 120,161**

**Claims priority, application Germany, March 4, 1970, P 20 10 153.5**

**Int. Cl. B65h** *33/00*

**U.S. Cl. 93—93 DP** **7 Claims**



Stacking apparatus for flattened bags of thermoplastic material welded and severed from an intermittently fed two-ply web in a bag-making machine, which is comprised of a pair of conveyor chains carrying equally spaced bag-gripping bars disposed, when located in the conveying run of said chains, to be moved from a bag-receiving end of the apparatus substantially at the same level and in the same direction as the web is fed in the bag-making machine. The gripping bars are arranged to enter the conveying run successively spaced from a welding tool of the machine equal to the length or width of the bags being made so that, when the web is stationary, its leading end can be engaged by one of the gripping bars. Means are provided for closing successive gripping bars to engage the bags severed from the web. Also, means are provided for intermittently advancing the conveyor chains in sequence with the operating cycle of the bag-making machine by a distance equal to the spacing of the gripping bars along the chains. Then successive gripping bars are opened to release the bags. A stacking conveyor is disposed beneath the conveying run of the chains and receives successive bags in a superposed fashion when released by the successive gripping bars. The superposed bags are carried away by the stacking conveyor when a predetermined number of bags has been superposed to form a stack.

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**3,672,266**

**SYSTEM FOR ERECTING THE BOTTOM FLAPS OF FOLDING-BOX BLANKS**

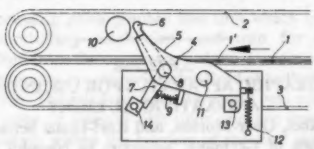
**Hartmut Klapp, Tupschelde, Germany, assignor to Jagenberg-Werke AG, Duesseldorf, Germany**

**Filed March 10, 1971, Ser. No. 122,709**

**Claims priority, application Germany, April 11, 1970, P 20 17 471.4**

**Int. Cl. B31b** *1/26*

**U.S. Cl. 93—49 R** **6 Claims**



In an apparatus for erecting the bottom flaps of folding-box blanks fed to an erecting station by a conveyor and including a pivotable erecting lever with a blank-contacting surface which causes said blank flap to be deflected relative to the balance of said blank, said erecting lever thereafter being pivoted under the force of said blank, a bell crank lever is pivoted to said erecting lever, one arm of said bell crank lever serving as a latch and locking said bell crank lever and said erecting lever against pivoting, the other arm of said bell crank lever including an abutment engaged by the leading edge of said box blank and functioning as a latch release, whereby pivoting of said erecting lever is permitted only after said blank has advanced to the location where its leading edge engages said abutment.

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**3,672,267**

**SEQUENTIAL CONTROL FOR CAMERA DIAPHRAGM AND SHUTTER**

**Donald M. Harvey, Webster, N.Y., and Randall T. McConaughey, Boulder, Colo., assignors to Eastman Kodak Company, Rochester, N.Y.**

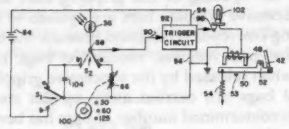
**Filed Oct. 1, 1970, Ser. No. 77,079**

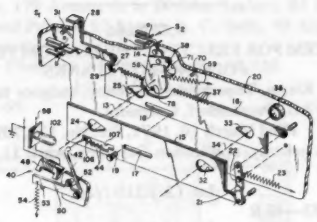
**Int. Cl. G03b** *7/08, 9/62*

**U.S. Cl. 95—10 CE** **8 Claims**

Exposure control apparatus comprises first and second blade members defining apertures and a photoelectric circuit that adjusts the blade members to form an exposure aperture of size according to the level of scene illumination. A photoelectric timing circuit integrates scene light with respect to time, and is actuated in response to adjustment of the blade members. The adjustment of the blade member and the initiation and termination of an exposure interval are controlled by a transducer that is actuated in response to a control signal from a trigger circuit. The transducer is adapted to adjust the blade members under the control of a voltage-dividing circuit,

and to actuate the shutter to uncover the exposure aperture simultaneously with the setting of the blade members to form the exposure aperture. The trigger circuit is then connected



with the light-integrating circuit that controls actuation of the transducer to actuate the blade members to close the exposure aperture after the exposure interval determined by that circuit.

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**3,672,268**

## PHOTOGRAPHIC APPARATUS FOR USE IN DAYLIGHT AND ARTIFICIAL LIGHT

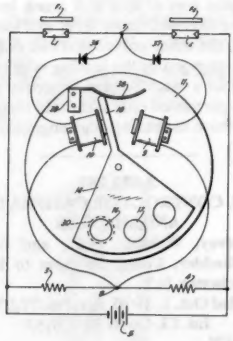
**Josef Scheibel, Over-Morlen, and Karl-Heinz Schadt, Schwalbach, both of Germany, assignors to Niezoldi & Kramer GmbH, Munich, Germany**

**Filed May 15, 1969, Ser. No. 824,880**

**Claims priority, application Germany, May 16, 1968, P 17 72 445.7**

**Int. Cl. G01j *1/22***

**U.S. Cl. 95—10 CE** **4 Claims**



A camera wherein one or more corrective filters are moved into or from the path of incoming scene light when the spectral composition of such light matches or does not match the spectral sensitivity of film which is used in the camera. The filter or filters can be displaced by an electric circuit having one or more photosensitive resistors which can change the condition of a relay, electromagnet or transistor whereby the latter energizes one or more electromagnets which are directly or indirectly connected with the filter or filters.

**3,672,269**

## SEQUENTIALLY OPERABLE HIDDEN CAMERA DEVICE

**Phyllis Tabankin, 23 Taconic Road, Livingston, N.J.**

**Filed April 8, 1970, Ser. No. 26,611**

**Int. Cl. G03b *29/00***

**U.S. Cl. 95—11** **4 Claims**

A sequentially operable hidden camera device, enclosing a camera therein with means to conceal the presence of the camera from the view of intruders, and which will trigger the camera by connection to an intruder detection system, to cause the camera to take a series of pictures of the intruder for identification purposes, and to deter the intruder by flashes connected with the operation thereof.

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**3,672,270**

## PHOTOGRAPHIC APPARATUS WITH BUILT-IN ELECTRICAL MOVING-COIL MEASURING INSTRUMENT

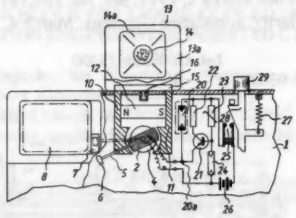
**Karl Wagner, Ottobrunn, and Josef Ganser, Munich, both of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany**

**Filed Jan. 26, 1971, Ser. No. 109,812**

**Claims priority, application Germany, Jan. 30, 1970, P 20 04 261.9**

**Int. Cl. G03b *17/18, 17/20, 15/03***

**U.S. Cl. 95—11 L** **13 Claims**



A photographic camera with a built-in exposure control assembly which utilizes a moving-coil electrical measuring instrument with a permanent magnet located without the coil. The measuring instrument is provided with two conductors consisting of magnetically conductive material and having pole shoes flanking the coil, median portions abutting against the poles of the permanent magnet and outer end portions which are accessible from without the housing of the camera and can attract a magnetically conductive yoke forming part of a flash unit or another camera accessory which is to be separably attached to the camera housing in a selected position. The coil has a pointer which is provided with a flag movable into and out of registry with a window in the view finder of the camera. The permanent magnet can influence the coil in such a way that the flag appears behind the window only when the yoke of the accessory is attracted by the outer end portions of the conductors. Alternatively, the coil can be in-

fluenced by the permanent magnet in such a way that the flag moves behind the window not only when the yoke abuts against the outer end portions of the conductors but also when the intensity of scene light decreases below a certain minimum value which is indicative that the camera cannot make satisfactory exposures at the prevailing scene brightness.

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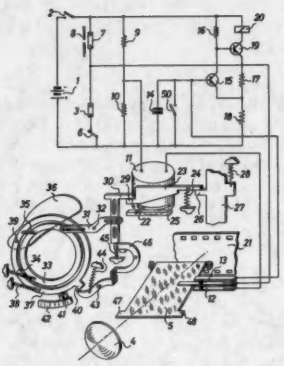
**3,672,271**
**AUTOMATIC EXPOSURE CONTROL FOR PHOTOGRAPHIC APPARATUS**

**Karl Wagner, Ottobrunn, and Klaus Nicolay, Gruenwald, both of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany**

**Filed Aug. 7, 1970, Ser. No. 62,035**
**Claims priority, application Germany, Aug. 20, 1969, P 19 42 285.6**
**Int. Cl. G03b 7/14**
**U.S. Cl. 95—10 CT** **13 Claims**



A moving-coil instrument having a pointer is connected diagonally of an electrical bridge of which two arms are photoconductors and respectively exposed to direct scene light and to scene light passing through the camera objective. The two photoconductors generate signals in response to the different light intensities, the moving-coil instrument operatively taking a position which is a function of the difference of the two signals to adjust the diaphragm opening during exposure while the photoconductor which receives direct scene light is switched into a time delay control circuit which determines the time of exposure.

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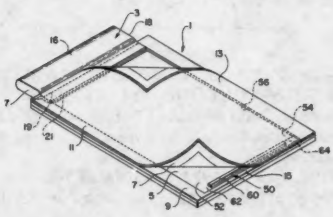
**3,672,272**
**PHOTOGRAPHIC FILM UNIT**

**Harold E. Cole, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed June 4, 1970, Ser. No. 43,322**
**Int. Cl. G03b 17/50**
**U.S. Cl. 95—13** **10 Claims**



A self-processing photographic film unit including a fluid flow-controlling mechanism and trap for diverting processing fluid from the center toward the corners of the unit and for collecting any excess processing fluid at the corners. The mechanism and trap are best adapted for use in composite or integral film units and are permanently locatable entirely within the borders of the unit, making unnecessary their separation from the unit after processing.

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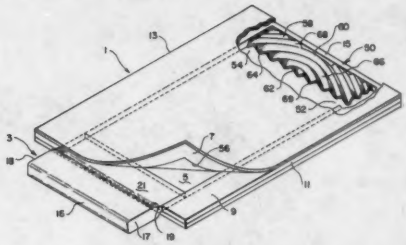
**3,672,273**
**PHOTOGRAPHIC FILM UNIT**

**Hubert Nerwin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed June 4, 1970, Ser. No. 43,323**
**Int. Cl. G03b 17/50**
**U.S. Cl. 95—13** **9 Claims**



A self-processing photographic film unit which includes a fluid flow-controlling mechanism and trap for diverting processing fluid from the center toward the corners of the unit while collecting any excess processing fluid at both the center and the corners. The mechanism and trap are best adapted for use in composite or integral film units and are permanently locatable entirely within the borders of the unit making unnecessary their separation from the unit after use. The trap may be formed by a porous material, a plurality of ridges, or corrugations.

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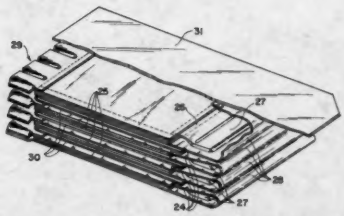
**3,672,274**
**ASSEMBLAGE AND PACK FOR SELF-PROCESSING FILM UNITS**

**William P. Ewald; Hubert Nerwin, and Donald M. Harvey, all of 901 Elmgrove Road, Rochester, N.Y.**

**Filed Oct. 2, 1970, Ser. No. 77,502**
**Int. Cl. G03b 17/50**
**U.S. Cl. 95—13** **4 Claims**



An assemblage of self-processing film units and a film pack or magazine for containing such units. The assemblage includes a plurality of stacked film units each including a central portion of one thickness supporting photosensitive material, and end portion of another thickness supporting a trap or excess fluid collector, and another end portion of another thickness for supporting a rupturable pod. A reduction in the overall thickness of the stacked trap-end portions is accomplished by nesting each or most of the traps with the traps of

the adjacent film units in the stack. The magazine is configured and adapted to house photosensitive portions of the stacked film units in a flat condition behind an exposure aperture, while the pod and trap portions are located at the ends of the magazine, only one end of which need be thicker than the central portion to receive the thicker pods.

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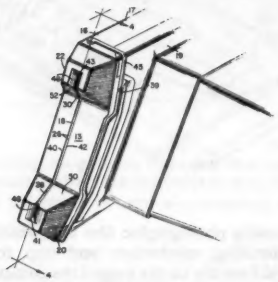
**3,672,275**

**PHOTOGRAPHIC APPARATUS FOR PROCESSING FILM MATERIAL**

**Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed June 29, 1970, Ser. No. 50,381**
**Int. Cl. G03b** *17/50*
**U.S. Cl. 95—13** **17 Claims**



A photographic camera is provided with a narrow elongated slot in the housing wall through which film sheets are withdrawn, and includes margin guides which extend outwardly from a recessed medial portion of the exterior edges of the slot so as to guide and support the longitudinal margins of the film.

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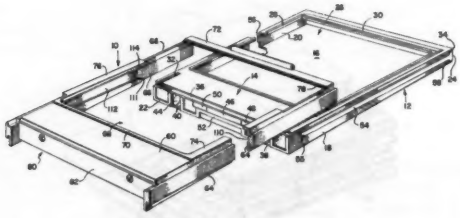
**3,672,276**

**FILM CONTAINER**

**Irving Erlichman, Wayland, Mass., assignor to Polaroid, Cambridge, Mass.**

**Filed Feb. 24, 1970, Ser. No. 13,623**
**Int. Cl. G03b** *19/10*
**U.S. Cl. 95—19** **36 Claims**



A film container designed for one-way insertion into a photographic structure having a support member especially adapted to receive the film container. The film container and support member are each provided with guide surfaces, e.g., a rail and a recess, which are adapted to mate in only one position of the film container and support member relative to each other. Upon mating, the film container is guided by these surfaces to a predetermined position within the photographic structure whereat one of the film units located within the film container is located in position for exposure. The guide surfaces restrict the path of movement of the container into the predetermined position to one which will minimize any possible damage to components of the photographic structure.

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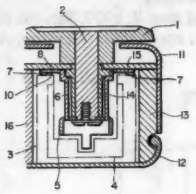
**3,672,277**

**DEVICE FOR IDENTIFYING PHOTOGRAPHIC SIZE**

**Tatsuo Kobayashi, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Minami-ku, Osaka, Japan**

**Filed May 26, 1970, Ser. No. 40,645**
**Claims priority, application Japan, June 3, 1969, 44/51627**
**Int. Cl. G03b** *19/04*
**U.S. Cl. 95—31 R** **5 Claims**



A device for identifying the picture size to be taken by a camera by using a cartridge-mounted film. The device comprises a picture size identifying member operatively connected to a film winding knob of the camera, so as to rub and imprint a marking on the surface of the film cartridge in response to the rotation of the film winding knob.

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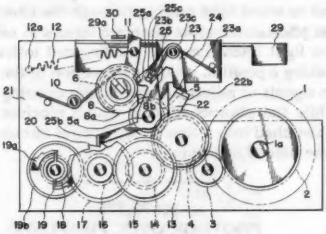
**3,672,278**

**CONTINUOUS PHOTOGRAPHING SYSTEM IN A ROLL FILM CAMERA**

**Akira Yamanaka, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Minami-ku, Osaka, Japan**

**Filed June 23, 1970, Ser. No. 49,015**
**Claims priority, application Japan, July 2, 1969, 44/51745**
**Int. Cl. G03b** *19/04*
**U.S. Cl. 95—31 FM** **3 Claims**



A continuous photographing system in a roll film camera in which, simultaneous with shutter release a film is automatically wound up by a single picture frame length and the shutter is charged to stop automatically, by means of a built-in driving source within the camera.

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**3,672,279**

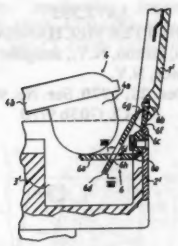
**PHOTOGRAPHIC APPARATUS WITH EJECTOR MEANS FOR FILM-CONTAINING MAGAZINES**

**Hubert Hackenberg, and Reinhard Nicko, both of Munich, Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany**

**Filed April 27, 1971, Ser. No. 137,765**
**Claims priority, application Germany, April 29, 1970, P 20 21 125.0**
**Int. Cl. G03b** *17/28*
**U.S. Cl. 95—31 R** **17 Claims**

The body of a still camera has a chamber for a film-containing magazine and a one-piece ejector consisting of elastic

synthetic plastic material. The ejector has an actuating arm which is connected to or constitutes a pivotable door serving to expose or to seal the chamber against entry of light, and an ejecting arm which brings about at least partial expulsion of a properly inserted magazine in response to movement of the actuating arm to that position which corresponds to open position of the door. A third arm of the ejector is bonded, glued or



screwed to the camera body, and the three arms are integrally connected to each other by elastic hinges which constitute weakened portions of the plastic ejector. The actuating arm can be connected to the ejecting arm by coupling elements which cooperate to move the ejecting arm to operative position during a certain stage of movement of the actuating arm to that position which corresponds to open position of the door.

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**3,672,280**

**CAMERA WITH RETRACTABLE LENS BARREL**

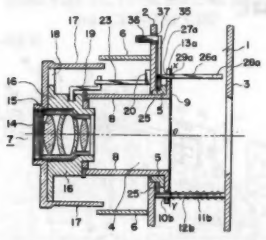
**Toshinori Imura, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Minami-ku, Osaka, Japan**

**Filed May 4, 1970, Ser. No. 34,126**

**Claims priority, application Japan, May 13, 1969, 44/43742**

**Int. Cl. G03b *17/04***

**U.S. Cl. 95—39** **3 Claims**



A plurality of guides **11** are mounted symmetrically about the optical axis of a camera to support a lens structure between picture taking and rest position. A spring is mounted around each guide to urge the lens barrel out from the camera casing. First interlocking members (**28***a*), (**28***b*) restrain the lens barrel at its rest position. Second interlocking members (**27***a*), (**27***b*) support the barrel at a selected picture taking position. A ring **25** is rotated to unlock the interlocking members from detents (**13***a*), (**13***b*) to allow the lens barrel to be moved.

**3,672,281**

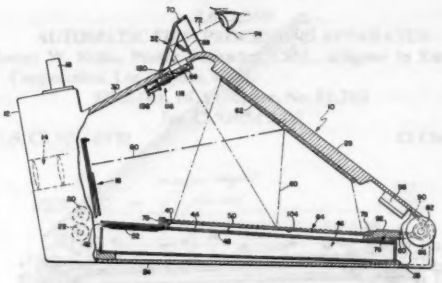
**REFLEX CAMERA**

**Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed April 15, 1970, Ser. No. 28,567**

**Int. Cl. G03b *19/12***

**U.S. Cl. 95—42** **37 Claims**



A reflex camera having a specular reflecting surface within the optical path to the film plane. An operator mechanism positions a viewing surface closely proximate the film plane for focusing purposes. In a subsequent exposure mode configuration, the operator mechanism positions a reflective surface within the optical path in a position causing a coincidence of a focal plane with the film plane.

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**3,672,282**

**DEVICE FOR DRIVING CAMERA SHUTTER CURTAINS**

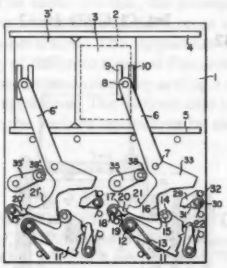
**Takeo Yamada, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan**

**Filed Jan. 16, 1970, Ser. No. 3,336**

**Claims priority, application Japan, Jan. 30, 1969, 44/6297**

**Int. Cl. G03b *9/42***

**U.S. Cl. 95—57** **3 Claims**



The working energy discharged by a driving spring for accelerating the shutter curtains and their associated moving members is mostly recovered by said springs during the deceleration stage for using the recovered energy for the next acceleration operation. The work required for the shutter charging is extremely reduced, while the shutter curtain travelling time is rather shortened.

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**3,672,283**

**PHOTOGRAPHIC APPARATUS**

**Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Continuation-in-part of Ser. No. 28,567, April 15, 1970. This application Nov. 12, 1970, Ser. No. 88,847**

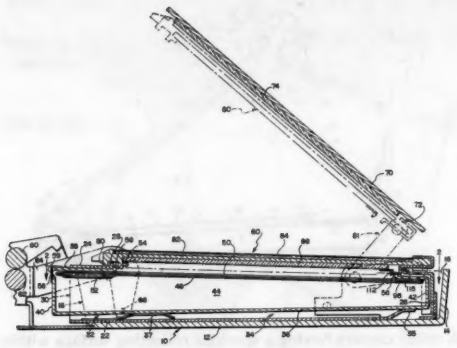
**Int. Cl. G03b *19/02*, *19/12***

**U.S. Cl. 95—11 R** **6 Claims**

An interface between a film container and a reflecting member mounted within a camera of the single-lens reflex

type for defining a lighttight seal substantially at or closely adjacent to the exposure plane of the camera.

The camera includes a chamber for receiving a film container, a reflecting member mounted for movement between a first position in which it is located substantially parallel with and closely adjacent to the camera's exposure plane containing a photosensitive element and in which it cooperates with the film container to form a lighttight seal about the photosensitive element and a second position in which it directs an image toward the photosensitive element located in position for exposure within the film container. The lighttight seal allows access to the interior of the camera to be made without prematurely exposing one of the photosensitive elements.



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**3,672,284**

**PHOTOGRAPHIC CAMERA**

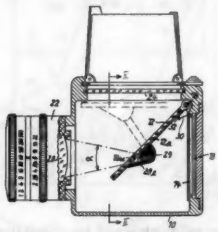
**Gerhard Schwarz, Schaffhauserstrasse 12, 8 Munich, 49, Germany**

**Filed Aug. 4, 1970, Ser. No. 60,898**

**Claims priority, application Germany, Aug. 19, 1969, P 19 42 119.3**

**Int. Cl. G03b *19/12***

**U.S. Cl. 95—42** **5 Claims**



A photographic camera having a light sensitive element (e.g., a photoresistance of a photocell) for measuring the intensity of a particular beam of incoming light, such as the light coming through the photographic lens, when the construction is used with a single lens mirror reflex camera. The light sensitive element is not in the path of but is offset from the beam of light to be measured. Light from the beam to be measured is transmitted to the light sensitive element through a cable of optical fibers, the output end of the fibers being at the light sensitive element, and the input end thereof lying in the path of the beam of light to be measured, for example lying behind a partially reflecting and partially transmitting portion of the reflex mirror. When the mirror is in the viewing position, the input end of the cable or bundle of fibers receives light from the incoming beam and transmits such light to the light sensitive element. When the mirror is swung up to the picture taking position, the light transfer between the input end of the bundle of fibers and the light sensitive element is interrupted. The light sensitive element is in an electric circuit performing a metering or controlling function, and this circuit includes a switch closed to make the circuit operative when the mirror is in the viewing position, and opened to make the circuit inoperative when the mirror is swung up to the picture taking position.

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**3,672,285**

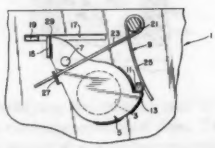
**SHUTTER MECHANISM**

**Jeffrey R. Stoneham, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Dec. 21, 1970, Ser. No. 99,942**

**Int. Cl. G03b *9/10***

**U.S. Cl. 95—59** **3 Claims**



A shutter mechanism including a pivotally mounted shutter blade which is rotatable between closed and open positions, a spring arm having a fixed first end and a second end which is engageable with the shutter blade for biassing the blade to the closed position, and a tab carried by the shutter blade for engaging the spring arm between the first and second ends to stop the rotation of the shutter at the open position and to return the shutter blade to the closed position.

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**3,672,286**

**DEVICE FOR ADJUSTMENT OF SHUTTERS AND DIAPHRAGMS IN PHOTOGRAPHIC APPARATUS**

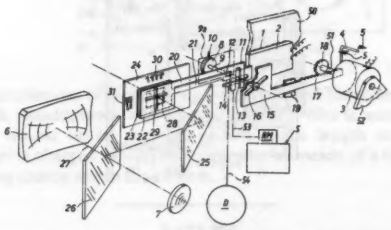
**Karl Wagner, Ottobrunn, and Helmut Durr, Munich, both of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany**

**Filed Sept. 18, 1970, Ser. No. 73,352**

**Claims priority, application Germany, Sept. 19, 1969, P 19 47 428.3**

**Int. Cl. G03b *7/02***

**U.S. Cl. 95—64 C** **18 Claims**



A photographic apparatus, particularly a still camera, wherein the upper right-hand corner portion of the front wall of the body supports a knob whose stem is confined to movements in a two-dimensional field. Vertical movements of the knob result in adjustments of the diaphragm, horizontal movements of the knob result in adjustments of the shutter, and movements of the knob in any other direction result in simultaneous adjustments of the shutter and diaphragm. The positions of the knob are observable in the view finder, and the knob can further rotate the moving coil instrument of an expo-

sure meter so that the needle of the instrument moves with reference to stationary markers to indicate whether or not the selected combination of exposure time and aperture size is satisfactory for the planned exposure.

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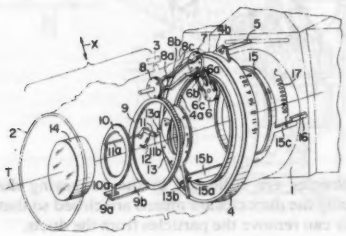
**3,672,287**
**SHIFTABLE OBJECTIVE LENS**
**Takeshi Muryoi, Yokohama-shi, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan**
**Filed Dec. 16, 1969, Ser. No. 885,510**
**Claims priority, application Japan, Dec. 25, 1968, 43/94479; Dec. 25, 1968, 43/94481; Dec. 25, 1968, 43/94482**
**Int. Cl. G03b 5/02, 9/02**
**U.S. Cl. 95—64 R** **2 Claims**



An objective lens interlocking with an exposure meter and a shutter in a camera wherein a parallel movement section including an objective lens system an aperture control ring, a diaphragm and an aperture adjusting cam member is arranged so as to move in unison in one predetermined direction in parallel with the film plane; and a rotation transmitting link mechanism is disposed between said parallel movement section and a stationary section with an aperture setting member of the objective lens so that the rotation of an aperture ring interlocked with exposure meter through an exposure meter coupling member on the aperture setting member may be transmitted to the exposure meter in all of the shifting direction. And the aperture control ring is interlocked with an automatic aperture controlling device of the camera.

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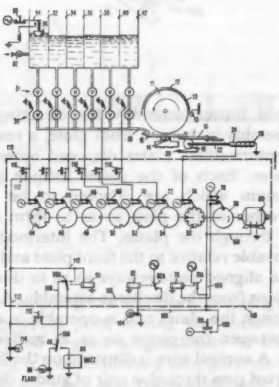
**3,672,288**
**AUTOMATED COLOR PRINT PROCESSOR**
**Thomas M. Deltoro, 721 East 213th Street, New York, N.Y.**
**Filed May 18, 1970, Ser. No. 38,318**
**Int. Cl. G03d 3/00**
**U.S. Cl. 95—89 R** **9 Claims**



Developing and conditioning solutions, and wash water, are automatically delivered in sequence through a single supply conduit to a tray for application to an exposed photographic medium. The conduit has inlet connections arranged at spaced positions therein for the introduction of the different liquids in sequence, with an inlet opening at the extreme end opposite to the conduit outlet end for the introduction of water. The tray is automatically tilted and emptied before each introduction and use of a new liquid.

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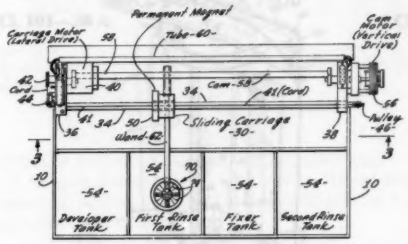
**3,672,289**
**AUTOMATIC FILM PROCESSING APPARATUS**
**James W. Kelso, Pacific Palisades, Calif., assignor to Xatron Corporation, Los Angeles, Calif.**
**Filed Oct. 16, 1970, Ser. No. 81,202**
**Int. Cl. G03d 3/00**
**U.S. Cl. 95—89 D** **12 Claims**




Apparatus for processing exposed film so as to develop, fix, wash and dry the film in a predetermined sequence and on a fully automatic basis. The exposed films are loaded into a carrier which is then set into the housing of the apparatus, and the films are successively dipped, or immersed, into a series of tanks within the housing by means of an elongated wand which supports the film carrier. The wand is carried on a laterally movable carriage, and a rotatable off-center cam is provided for causing the wand to move the film carrier vertically in and out of the aforesaid tanks. This dipping operation occurs at each of a plurality of predetermined lateral positions of the carriage. The tanks contain, for example, appropriate developing, rinsing and fixing solutions so as to carry out the film processing operations. The apparatus may be set to process a plurality of different types of film, each according to manufacturers' recommendations, by setting a dial on the control panel of the apparatus. The various dial settings provide pre-set timing for the various operations by the circuitry employed.

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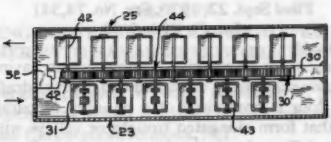
**3,672,290**
**FILM PROCESSING APPARATUS**
**George W. Duesler, 221 Monticello Drive, Odessa, Tex.**
**Filed Oct. 13, 1969, Ser. No. 865,783**
**Int. Cl. G03d 3/12**
**U.S. Cl. 95—94 R** **12 Claims**



Film processing apparatus enclosed within a housing and having two spaced apart rows of treatment tanks, a light-proof room, a light trap which emits film from the light-proof room, a combination washing and re-exposure tank, and wherein each individual tank includes a temperature control and a fluid circulation means associated therewith.

A longitudinally extending gear train having shafts from ad-

jacent gears extending in opposite directions to adjacent tanks of each row thereof drives the film upwardly and downwardly through the tanks in a particular manner which prevents the emulsion side of the film from contacting a supporting surface throughout the entire process.

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**3,672,291**

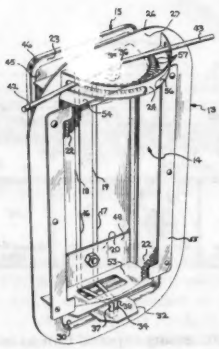
**VENTILATOR UNIT**

**Anthony Kujawa, Jr., Toledo, Ohio, assignor to Production Research, Inc., Toledo, Ohio**

**Filed July 20, 1970, Ser. No. 56,324**

**Int. Cl. B60h 1/24**

**U.S. Cl. 98—2.16** **12 Claims**



A ventilator mountable as a preassembled unit over a wall opening in a compartment such as, for example, the passenger compartment in a motor vehicle, truck cab, water craft, air craft, mobile home, truck camper, or the like, to regulate the passage or flow of air exchanged through the wall opening between the interior confines of the compartment and the ambient exterior atmosphere. The ventilator unit includes a frame member mountable around the bordering surface of the wall opening and provided with an open central section through which passage of air is regulated in selectively variable manner by a cover member which is shiftable between a closed and various selective open intake and/or exhaust positions by intercooperative means providing selectively shiftable pivot axes for opposite sides or sections of the cover member and cooperating therewith in such manner as to accommodate relatively independent raising and/or lowering of each of such opposite sides or sections of the cover member as well as relatively concurrent raising and/or lowering thereof between open and closed positions.

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**3,672,292**

**BLAST-ROOM FOR ABRASIVE BLASTING SYSTEM**

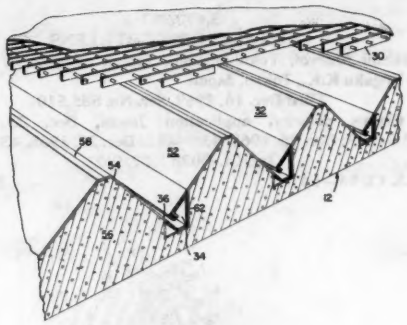
**Ted A. Arnold, Palo Alto, Calif., assignor to Vacu-Blast Corporation, Belmont, Calif.**

**Filed Sept. 22, 1970, Ser. No. 74,341**

**Int. Cl. B24c 9/00**

**U.S. Cl. 98—33** **15 Claims**

A blast-room for an abrasive blasting system having a floor with closeable scavenging ducts and end or cross draft ventilation. The floor is comprised of a plurality of parallel floor members that form elongated troughs or valleys with sloped sides to trap falling abrasive and waste particles. Between each pair of adjacent floor members and extending below their lower edges is a duct member having an elongated opening which is periodically closeable by a controllable closure means such as an inflatable valve member that provides an airtight seal. At one end of the floor the ducts have small permanent openings to permit air to enter and their other ends are connected to a suction fan capable of creating a conveying air velocity in the ducts when the closure means has closed. During operation of the blast-room the closure means remains open for a period of time while a quantity of abrasive and



waste particles are collected in the conveying ducts, then periodically the duct closure means are closed so that the conveying air can remove the particles from the ducts.

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**3,672,293**

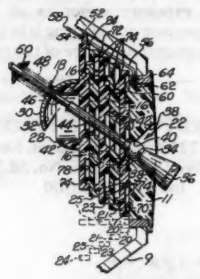
**REGISTERED LOUVER ASSEMBLY**

**Donald J. Gona, 6501 Glenallen Drive, Solon, Ohio, and Richard J. Oster, 10907 Parkhurst Drive, Cleveland, Ohio, assignors to Eaton Yale & Towne Inc., Cleveland, Ohio**

**Filed March 3, 1971, Ser. No. 120,433**

**Int. Cl. F24f 13/08**

**U.S. Cl. 98—40 VM** **9 Claims**



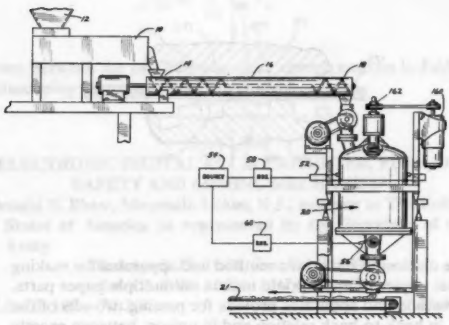
A registered louver assembly for directing air from a discharge assembly includes a front plate, a rear plate and a plurality of intermediate plates disposed between the front and rear plates. Each of the plates include a plurality of openings therein which are adapted to be aligned with openings in other of the plats so as to form a plurality of passageways through the plates. The intermediate and rear plates are movable relative to the front plate and to each other to incline the aligned passageways so as to direct air in different directions from the discharge assembly. A control rod is disposed through the plates and is operable in effect relative movement between the plates so as to incline the aligned passageways. A control wire is disposed on the front plate and the ends thereof pass through a pair of guides disposed on the rear plate. The control wire prevents skewing of the plates relative to each other by providing positive positioning of the plates in response to movement thereof by the control rod.

3,672,294

## APPARATUS FOR TREATING GRANULAR MATERIAL

John O. Blixrud, St. Louis Park; Wayne I. Knigge, Bloomington; Stanley C. Rustad, Golden Valley, and Takuzo Tsuchiya, Minneapolis, all of Minn., assignors to General Mills, Inc.

Filed Feb. 22, 1971, Ser. No. 117,597
Int. Cl. A23b 9/00
U.S. Cl. 99—237 R 20 Claims



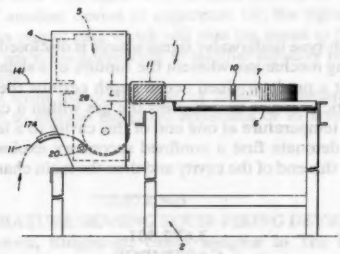
A vertically oriented pressure cooker for treating granular materials on a continuous basis. A cylindrical cooking chamber, having a flat bottom surface with a discharge opening centrally located therein, is at least partially filled with the material to be cooked, by introducing the material and pressurized steam into the top of the chamber. A vertical shaft is rotatably mounted within the chamber, and it has a pair of curved discharge arms secured to its bottom end, and a pair of leveling arms secured to it, proximate the upper part of the chamber. A cylindrical shield having a larger diameter than the diameter of the discharge opening surrounds the shaft. By rotating the shaft, a layer of material is transferred along the bottom surface of the chamber toward the discharge opening.

3,672,295

## STRAPPING MACHINE

Frank C. Weller, Chicago, Ill., assignor to Interlake, Inc., Chicago, Ill.

Filed Aug. 13, 1970, Ser. No. 63,479
Int. Cl. B65b 13/16
U.S. Cl. 100—4 12 Claims



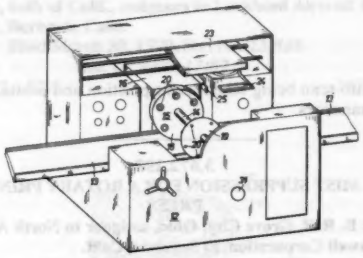
A short-seat strapping machine has a strapping head including pairs of gripping jaws, sealing and shearing jaws, and gathering jaws, all aligned longitudinally of the strap, the machine having a loop-tensioning configuration wherein the gathering jaws are open and the sealing jaws are partially closed to take the place of the gathering jaws, thereby accommodating tensioning of the strap in a loop about an object wherein the portion thereof facing the head has a dimension longitudinally of the strap less than the distance between the outer ends of the gripping jaws and gathering jaws, but not less than the distance between the outer ends of the gripping jaws and shearing jaws; the gathering jaw and sealing jaws are linked together for simultaneous actuation to the loop-tensioning configuration.

3,672,296

## SCREEN PRINTING MACHINE FOR PRINTING CYLINDRICAL AND CONICAL ARTICLES

Wilfried Kammann, 1 Bustedlerstrasse, Suedlengern, Germany

Filed June 5, 1969, Ser. No. 830,778
Claims priority, application Germany, June 11, 1968, K 61471; June 11, 1968, K 61472
Int. Cl. B41f 17/28, 17/20
U.S. Cl. 101—38 A 1 Claim



A screen printing machine for printing on cylindrical and conical articles. The machine has a reciprocating printing stencil with a fixed ductor for applying printing. There are provided holding devices for the articles means for rotating the holding devices while the articles are in contact with the printing stencil and means for adjusting the devices to bring the articles into a normal position for printing. The holding devices comprise receiving members, and a feeding device carrying the receiving members and actuated to move the articles to be printed in timed sequence. The receiving members are made of slidable material.

3,672,297

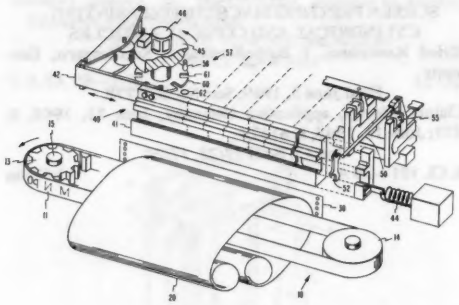
## PRINTING CONTROL DEVICE IN HIGH SPEED CHAIN PRINTER WITH HAMMERS MOVABLE TO PLURAL PRINT POSITIONS

Neil C. Berglund; Robert W. King, and Kent W. Swearingen, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1970, Ser. No. 51,190
Int. Cl. B41j 9/14, 5/30
U.S. Cl. 101—93 C 17 Claims

A high speed printer of the chain type in which the type characters on the chain are spaced apart a distance greater than the distance between adjacent print positions and in which the number of firing hammers is less than the number of print positions such that each hammer services several print positions. The attachment or control for the printer maintains

identity of the type character in front of a print position optioned to print by modifying a type character counter in accord with scan being taken, print position and position of the firing hammers.



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**3,672,298**

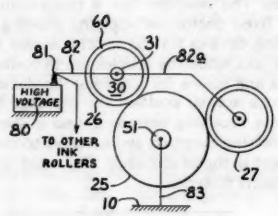
**INK MIST SUPPRESSION FOR A ROTARY PRINTING PRESS**

**Robert B. Reif, Grove City, Ohio, assignor to North American Rockwell Corporation, El Segundo, Calif.**

**Filed Jan. 29, 1970, Ser. No. 6,677**

**Int. Cl. B41f *31/00***

**U.S. Cl. 101—350** **2 Claims**




An ink mist suppressing arrangement for a printing press having a resiliently covered roller and cooperating cylinder carrying a film of ink and rotated at high speed in which the roller is insulated from the cylinder and charged with high voltage for the setting up of an electric field between the roller and cylinder for acting upon and returning ink mist particles to the film. The resilient surface layer on the roller may be formed of conventional material, for example synthetic rubber and in conventional thickness. No auxiliary wire or similar electrode, such as commonly used for establishing a corona discharge, need be employed.

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**3,672,299**

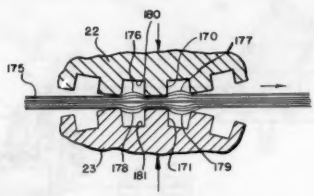
**MATCHED PLATE METHOD FOR PRINTING ON MULTIPLE PAPER PARTS**

**James B. Fulk, 18309 Lexington Drive, Monte Sereno, Calif.**

**Filed Nov. 12, 1970, Ser. No. 88,682**

**Int. Cl. B41f *5/04***

**U.S. Cl. 101—426** **3 Claims**




The disclosure includes a method and apparatus for making graphic copies of appropriate indicia on multiple paper parts. The method and apparatus provide for passing two sets of the parts, in back-to-back relation and in unison, between exactly matching opposed embossed surfaces.

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**3,672,300**

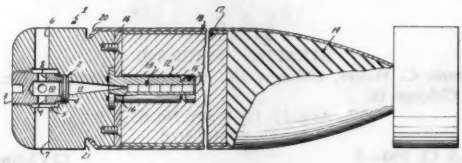
**PRESSURE ACTUATED ACOUSTIC SIGNAL SOURCE**

**Carl A. Axelson, Beverly; John R. Hinves, Somerset, both of Mass., and Elton Y. McGann, Williamsburg, Va., assignors to The United States of America as represented by the Secretary of the Navy**

**Filed Nov. 16, 1970, Ser. No. 89,677**

**Int. Cl. F42b *21/00, 22/36***

**U.S. Cl. 102—10** **5 Claims**



A bomb-type underwater signal source is disclosed having a detonating mechanism wherein the rupture of a shear disk assembly at a predetermined ocean depth permits the ambient hydrostatic pressure to compress the gas within a cavity and raise the temperature at one end of this cavity to a level sufficient to detonate first a confined secondary explosive positioned at this end of the cavity and then the main charge.

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**3,672,301**

**CARTRIDGE**

**David D. Abbott, Baltimore County, Md., assignor to AAI Corporation, Cockeysville, Md.**

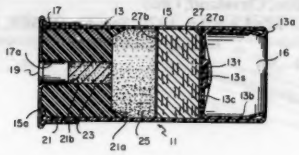
**Filed Dec. 31, 1969, Ser. No. 889,616**

**Int. Cl. F42b *5/20***

**U.S. Cl. 102—39** **8 Claims**

A blank or propellant gas cartridge having a casing of generally tubular form with a telescopically reverse in-folded star-crimp closed integral tubular end section, and within which is contained a blank propellent powder charge, with a

readily rupturable low tensile strength discrete particulate mass adhesively self-bonded in a total initial restraining mass




form between the propellent powder charge and the in-folded telescoping star-crimp closed end of the casing.

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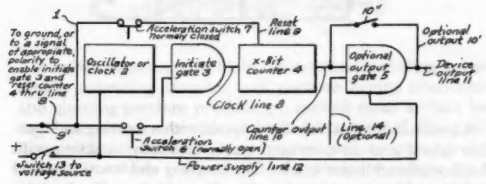
**3,672,302**

**ELECTRONIC DIGITAL ACCELEROMETER, FUZE, OR SAFETY AND ARMING MECHANISM**

**Donald N. Shaw, Mountain Lakes, N.J., assignor to The United States of America as represented by the Secretary of the Army**

**Filed April 27, 1970, Ser. No. 31,960**
**Int. Cl. F42c** *11/06, 15/24, 15/40*
**U.S. Cl. 102—70.2 R** **7 Claims**


1
To ground, or to a signal of appropriate polarity to enable initiate gate 3 and reset counter 4 thru line 18
Acceleration switch 7 thermally closed
Reset line 9
10'
Optional output 10'
Oscillator or clock 2
Initiate gate 3
X-bit counter 4
Optional output gate 5
Device output line 11
Clock line 8
Counter output line 16
Line 14 (optional)
Acceleration switch 6 (normally open)
Switch 13 to voltage source
Power supply line 12

Electrical apparatus comprises an oscillator or clock to feed pulses through an initiate gate to a digital X-bit counter. The counter is normally maintained at a zero level, or empty state, in condition to receive and temporarily store a maximum number of pulses, by a normally closed switch in an input line. And, pulses normally are not fed to the counter due to an open switch in an input line to the initiate gate. Upon acceleration of the apparatus the normally open switch closes to actuate the initiate gate, and the normally closed switch opens to permit the counter to begin counting or storing pulses therein. When the number of pulses reaches a predetermined value after a predetermined time delay, the counter fires off a signal to an output line. This signal may be used directly to trigger actuation of another device or apparatus. Or, the signal may be fed into an output gate which will pass the signal to the apparatus only upon the application of another signal or pulse to the output gate.

The signal from the output line, or from the output gate, may be used to actuate explosive apparatus or to arm other devices.

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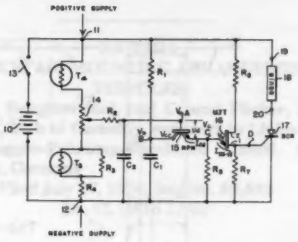
**3,672,303**

**TEMPERATURE SENSING SQUIB FIRING DEVICE**

**John M. Brawn, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy**

**Filed May 28, 1970, Ser. No. 41,437**
**Int. Cl. F42c** *11/06, 15/40, 19/06*
**U.S. Cl. 102—70.2 R** **4 Claims**

An atmospheric temperature sensing squib firing contrivance for igniting an explosive device at a specific outside temperature, comprising an atmospheric temperature sensor, a time delay safety function that prevents premature ignition, an enabling function that allows ignition when the desired input conditions are met, the ignition function, and an inside




temperature sensor that stabilizes the circuits against changing ambient temperature of the explosive device.

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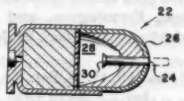
**3,672,304**

**SPECIAL PURPOSE FIREARMS PROJECTILE**

**Patrick F. Rogers, Cupertino, and Warren L. Hendrickson, San Jose, both of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.**

**Filed March 30, 1970, Ser. No. 23,825**
**Int. Cl. F42b** *11/02*
**U.S. Cl. 102—92.3** **1 Claim**




A small arms bullet with controlled flight characteristics fireable at high velocities from conventional small arms. The bullet has a projecting spike tip forming a supersonic shock wave cone. The bullet travels inside this shock wave cone and has low aerodynamic drag at supersonic velocities. The bullet is light weight and has a blunt drag face providing a high aerodynamic drag configuration for the bullet at subsonic flight velocities to rapidly decelerate the bullet after a preselected initial combat range, thereby reducing its long range danger to bystanders and property. Within the preselected combat range the shape and velocity characteristics of the bullet provide high "stopping power" yet a reduced lethality.

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**3,672,305**

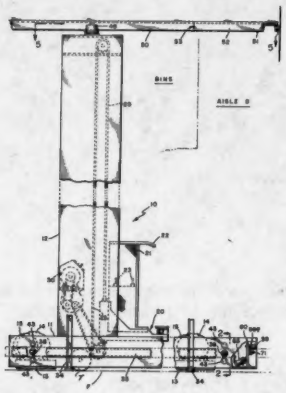
**GUIDE MEANS FOR A TRAVERSING VEHICLE**

**Kenneth A. Richins, Salt Lake City, Utah, assignor to Eaton Corporation, Cleveland, Ohio**

**Filed May 11, 1970, Ser. No. 36,308**
**Int. Cl. B61b** *13/08*
**U.S. Cl. 104—23 FS** **9 Claims**

An air supported vehicle is guided by trackways at one or both sides thereof, in which the trackways contact guide rollers mounted on the vehicle. The rollers contact the trackway to prevent lateral movement while permitting variations in the vertical positioning of the vehicle by the air. Additional rollers on the vehicle may limit its vertical movement or lock it in a fixed vertical position relatively to the trackways. The vehicle may be moved away from the side trackways for guidance by other trackways and additional guides on the vehicle. The upper end of the vehicle is guided by upper trackways that are

formed to permit ready movement of the vehicle in an aisle, from one aisle to another and vertical movement of the vehicle within predetermined limits while preventing movement laterally of the vehicle during movement in an aisle.



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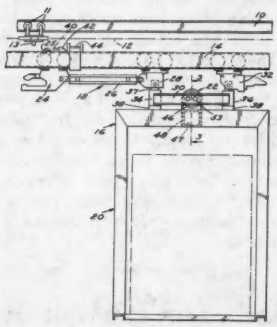
**3,672,306**

**CONVEYOR CARRIER WITH PIVOTAL MOTION DAMPING LOAD SUSPENSION**

**Clarence A. Dehne, Farmington, and Harold A. Folsom, Livonia, both of Mich., assignors to Jervis B. Webb Company**

**Filed Nov. 10, 1970, Ser. No. 88,314**
**Int. Cl. B61b *3/00***
**U.S. Cl. 104—89** **10 Claims**



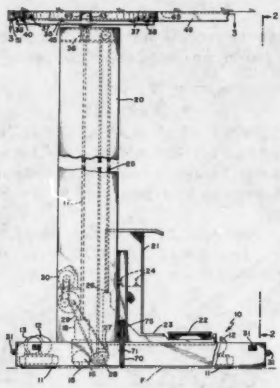
A pivotal motion damping suspension for the load carrying portion of a conveyor carrier includes a tubular bearing member secured to the load carrying portion and internally slideably engaged by a pair of bearing segments mounted on the track supported portion of the carrier. The bearing segments engage the tubular bearing member at circumferentially spaced locations thereon, and swinging motion of the load carrying portion in either direction produces an increased force normal to one of the bearing segments and an increase in the frictional resistance between such bearing segment and the tubular bearing member which brakes and dampens swinging motion.

**3,672,307**

**VEHICLE WITH COORDINATED GUIDING AND SUPPORTING MECHANISM**

**Kenneth A. Richins, Salt Lake City, Utah, assignor to Eaton Corporation, Cleveland, Ohio**

**Filed April 6, 1970, Ser. No. 25,908**
**Int. Cl. B61b *15/00***
**U.S. Cl. 104—96** **10 Claims**



A load handling vehicle is equipped with a steering and traction wheel and an overhead guide assembly coacting with fixed overhead linear tracks. The steering and traction wheel and the guide assembly rotate together so as to guide the vehicle and support it in its movement in different paths. The overhead tracks are connected by a circular track to permit transfer of the guide assembly from one linear track to another.

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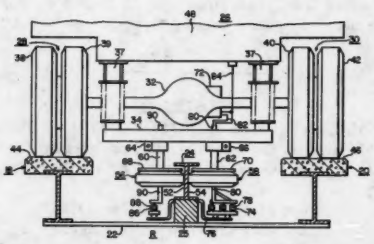
**3,672,308**

**ROADWAY SWITCHING ARRANGEMENT FOR TRANSPORTATION SYSTEM HAVING CENTER GUIDERAIL BELOW TRACK LEVEL**

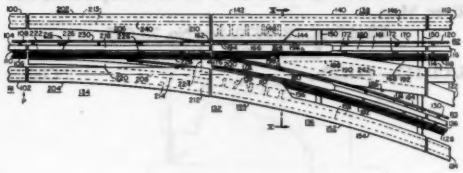
**William R. Segar, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Nov. 6, 1970, Ser. No. 87,428**
**Int. Cl. E01b *7/12*; B61b *13/04*; F01b *23/06***
**U.S. Cl. 104—246** **9 Claims**



A switching arrangement for a transportation system employing flexible-tired self-propelled vehicles riding on road-

ways having laterally spaced tracks and a guide beam (guide rail) therebetween which is engaged by guide wheels carried



by supports depending from the undercarriage of the vehicle.

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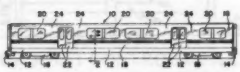
**3,672,309**
**WELDED LIGHT ALLOY CAR CONSTRUCTION**

**William Van Der Sluys, Crown Point, Ind.; Thomas J. O'Neill, Evergreen Park, Ill., and Norman M. Szala, Hammond, Ind., assignors to Pullman Incorporated, Chicago, Ill.**

**Filed July 13, 1970, Ser. No. 54,181**
**Int. Cl. B61d *17/08***
**U.S. Cl. 105—401** **7 Claims**



A railway passenger vehicle construction including longitudinally extending extruded wall portions having interlocking and abutting portions producing a smooth outer surface having a curvature eccentric with the curvature of the vehicle inner wall to improve the aerodynamic and structural properties of the vehicle walls. Adjacent extruded members are attached as by a weldment on their inside portions in a manner to prevent buckling and provide a finished external surface free of blemishes from weldments or other fastening means.

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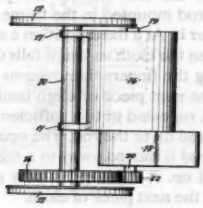
**3,672,310**
**RAILWAY TRANSMISSION**

**John Henry Gooch, Goldsmith Cottage, Albourne, Hassocks, England**

**Filed Sept. 29, 1969, Ser. No. 861,711**
**Claims priority, application Great Britain, Oct. 16, 1968, 49,033/68**
**Int. Cl. B61d *9/34, 9/48*; F16h *47/02***
**U.S. Cl. 105—96.2** **5 Claims**



The invention provides a two speed transmission system for a diesel electric locomotive having a bogey or like live axle carrying means, a live axle journaled in said axle carrying means and connecting together a pair of driving wheels, an electrical traction motor held in spaced relation relative to said live axle by at least one steady arm pivoted on said live axle, means for supporting at least a part of the weight of said motor from said bogey and a driving unit connecting the shaft of said motor to said axle said driving unit including a disengageable positive coupling means such as a synchronous clutch in said driving connection between said motor shaft and said axle and a slip coupling such as a fluid coupling one element of which is connected to each element of said positive coupling means.

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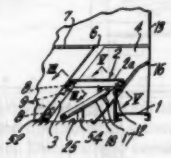
**3,672,311**
**MOVABLE STAIR MOUNTING ARRANGEMENT FOR VEHICLES**

**Erwin Duba, Salzgitter-Bad, and Conrad Fischer, Salzgitter-Lebanstedt, both of Germany, assignors to Linke-Hofmann-Busch Waggon-Fahrzeug-Maschinen GmbH, Salzgitter-Watenstedt, Germany**

**Filed July 27, 1970, Ser. No. 58,555**
**Int. Cl. B61d *23/02***
**U.S. Cl. 105—447** **12 Claims**



A mounting arrangement for a movable step of a multi-step entry for a vehicle, particularly for rail vehicles, includes a movable step member having a flat outwardly extending platform portion and an oblique inner end portion which rides in an oblique groove to permit the step to be shifted between an upward position at which the platform is level with the entrance way and a lower position in which it is slightly above a lower entrance step of the entry. The construction includes a mounting for a running roller which facilitates the running upward and downward movement of the guide for the step and a mounting for a support roller. The support roller is pivotally mounted on a bracket of the guide and it may be biased into engagement with the wall bounding the guide way for controlling the movement of the step. An apron is pivoted to the front end of the step platform and it includes a bracket having a roller which extends into a guideway so as to shift the apron inwardly and outwardly during the downward and upward movement of the platform. In this manner the apron closes the space between the platform and the bottom of the cut out entry of the vehicle.

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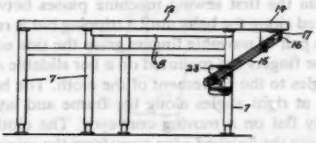
**3,672,312**
**WORK TABLE HAVING MULTIPOSITION EXTENSION BOARD**

**Robert F. Pettit, and James F. Wesnoskie, both of Reading, Pa., assignors to Teledyne, Inc., Los Angeles, Calif.**

**Filed Dec. 17, 1969, Ser. No. 885,801**
**Int. Cl. A47b *1/04***
**U.S. Cl. 108—69** **5 Claims**



A work table having an extension board at an edge thereof and mounting mechanism by which the board may be positioned alternatively in any one of three positions, in one of which the board extends from the edge of the table, in another of which the board projects upwardly adjacent said edge of the

table to act as a limiting stop, and in the third of which the board is stowed beneath the table.

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**3,672,313**

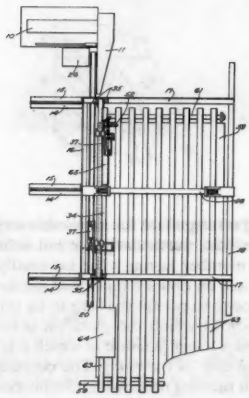
**CLOTH TRANSFER DEVICE**

**Harry Firestein, Mamaroneck, N.Y., and Karl Tyas, Ocean Grove, Mass., assignors to Louis Hand Incorporated, Fall River, Mass.**

**Filed Sept. 25, 1970, Ser. No. 75,451**

**Int. Cl. D05b *33/02***

**U.S. Cl. 112—121.15** **6 Claims**



In the manufacture of curtains, draperies, and similar textile items, it is often necessary to perform separate sewing operations on opposite seams of a piece of cloth. The operator turns a small hem and passes the edge of the cloth beneath the needle of a sewing machine. It may then be necessary to perform a similar operation on the opposite hem or even to attach a piece of buckram to the opposite hem. The apparatus of the present invention is designed to transfer the cloth from one operation to the next operation to minimize handling and to permit a single operator to perform the necessary sewing operations on both hems. The device grasps the length of cloth coming from the first sewing machine, turns it over to place the finished edge remotely from the line of travel and then feeds the opposite unsewed edge to a second machine which again hems the device or sews a piece of buckram thereto. Essentially, the carrying device comprises a pair of endless belts operating in contiguous relationship and driven from a common source. The endless belts are driven so that the cloth coming from the first sewing machine passes between them and is carried along the belts until a tripping bar is reached. At this point a pair of movable fingers grasp the side edges of the cloth. These fingers are mounted on a bar slidable on a frame at right angles to the movement of the cloth. The bar and fingers move at right angles along the frame and lay the cloth horizontally flat on a moving conveyor. The cloth has now been laid with the finished edge away from the original moving belts and the unfinished edge closest to them. Movement is parallel to but spaced from the original endless belts and the cloth is fed to an automatic device having an edge guider, of conventional design, which now proceeds with the second operation. A single operator is thus able to perform a sewing operation on opposite edges of the same piece of cloth without additional handling.

**3,672,314**

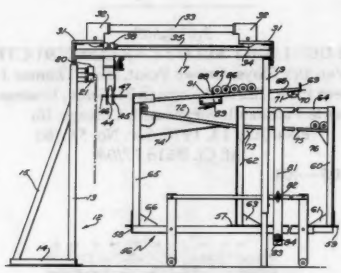
**CLOTH STACKING DEVICE**

**Harry Firestein, Mamaroneck, N.Y., and Karl Tyas, Ocean Grove, Mass., assignors to Louis Hand Incorporated, Fall River, Mass.**

**Filed Sept. 18, 1970, Ser. No. 73,545**

**Int. Cl. D05b *33/02***

**U.S. Cl. 112—121.29** **7 Claims**



The apparatus is designed to grasp a length of cloth coming from a sewing machine and to drape it over a horizontal bar. A plurality of lengths of cloth can thus be stacked one above the other on a horizontal bar. Means are then provided for moving the bar out of position and moving an empty bar into position so that successive lengths of cloth from the sewing machine can be stacked. Essentially the carrying device comprises a pair of endless belts operating in contiguous relationship and driven from the same source. The endless belts are driven so that the cloth coming from the sewing machine passes between them and is carried along between the belts until a tripping bar is reached. At this point a pair of movable fingers grasps the side edges of the cloth and the stacking takes place. A frame is provided on which an elongated bar is slidably movable at right angles to the endless belts. The fingers which grasp each side edge of the cloth are mounted on this bar. As soon as the fingers grasp the cloth the bar moves at right angles to the belts along a frame. The bar on which the cloth is stacked is positioned in a separate frame mounted beneath the carrier frame for the bar. The bar carrying the fingers then moves over the rod mounted in the frame beneath it and carries the cloth over it. At a fixed position a switch is tripped and the fingers release the cloth so that it falls draped over the rod. The bar carrying the fingers then returns to its original position ready for the next piece of cloth issuing from the sewing machine. This is repeated until a sufficient amount of cloth is piled up or stacked on to the rod. The operator then presses a button and the rod is moved away to a remote position where it can be picked up. A fresh rod is now moved into position ready to receive the next piece of cloth.

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**3,672,315**

**AUTOMATIC ACTUATING MECHANISM**

**Adelbert W. Rockwell, Jr., Gloucester, Mass., assignor to USM Corporation, Boston, Mass.**

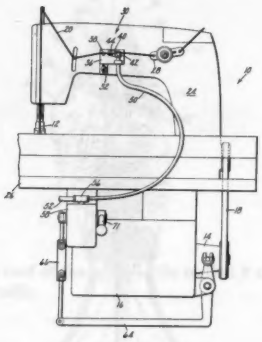
**Filed Aug. 3, 1970, Ser. No. 60,555**

**Int. Cl. D05b *69/36***

**U.S. Cl. 112—219 R** **2 Claims**

Fluidic mechanism is responsive to an event, for instance a contingency such as thread breakage in a sewing machine, to

operate a control member whereby a clutch is actuated, for instance to disconnect a drive motor from the sewing machine.



A transducer preferably in the form of a contractile bag is employed in the surveillant fluidic control circuit.

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**3,672,316**

## APPARATUS FOR JOINT CONTROL OF A CLUTCH AND ELECTRICAL SWITCHES

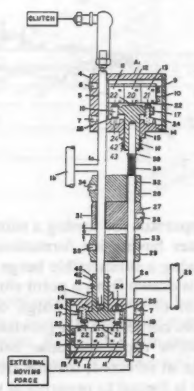
**Ernst Becker, and Karl Notz, both of Darmstadt, Germany, assignors to Quick-Elektromotoren-Werk GmbH, Darmstadt, Germany**

**Filed Jan. 27, 1967, Ser. No. 612,129**

**Claims priority, application Germany, Jan. 28, 1966, P 15 38 049.1**

**Int. Cl. D05b *69/00***

**U.S. Cl. 112—219 A** **11 Claims**




An apparatus for operating a clutch mechanism and automatically and mechanically therewith a plurality of switches for control of additional motors.

Two mechanical tie rods, one linked with its outer end to the clutch, the other operated by external power application upon its opposite outer end, engage electrical switches, which are mechanically connected with them for automatic selectively preset time-spaced motive operations of the clutch and the switches with a precalculated lost motion of the switch operations.

**3,672,317**

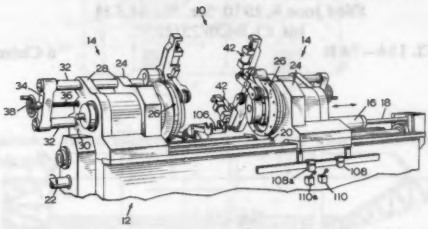
## METAL SPINNING MACHINE

**Roy Walker Lee Halling, Galt, Ontario, and Paul Krilsa, Willowdale, Ontario, both of Canada, assignors to Export Tool & Welding Co. Limited, Rexdale, Ontario, Canada**

**Filed Feb. 19, 1971, Ser. No. 116,930**

**Int. Cl. B21d *51/32***

**U.S. Cl. 113—1 E** **8 Claims**



A metal spinning mechanism mountable on the bed of a spinning machine and operable for securing end caps to muffler cans and the like. The machine consists of a frame which forms a bed and a pair of rotatably driven head assemblies mounted on the bed. One of the head assemblies is slidably mounted on the bed so as to be moved towards and away from the other assembly. Each of the head assemblies includes a cam track extending in a predetermined path about the longitudinal axis of the head assembly and a pair of cam follower arms pivotally mounted on the housing. A first forming arm is pivotally mounted on one of the follower arms and a second follower arms is pivotally mounted on the second follower arm. Hydraulic drive means is provided for driving each of the forming arms towards the longitudinal axis of the spinning head so as to sequentially form the spinning metal to the required contour in use.

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**3,672,318**

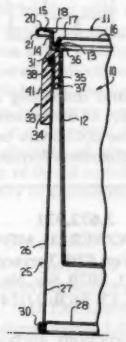
## SUPPORT FOR HAM CANS DURING DOUBLE SEAMING

**John B. Nicholson, Country Club Hills, Ill., assignor to Continental Can Company, Inc., New York, N.Y.**

**Filed May 1, 1970, Ser. No. 33,564**

**Int. Cl. B21d *19/00***

**U.S. Cl. 113—30** **15 Claims**



This disclosure relates to a support for supporting ham or similar pear-shaped plastic cans during a double-seaming operation, and includes as a base thereof a standard or conventional metallic ham can body having a double seam at an uppermost end portion thereof, and a like contoured plastic rim snap-secured over the double seam, the rim including an

uppermost surface for supporting the plastic ham can by underlyingly engaging a flange thereof, and an outermost surface of an outermost one of a pair of legs of the rim defining a guiding surface for properly positioning the support relative to an associated end unit incident to a seaming operation.

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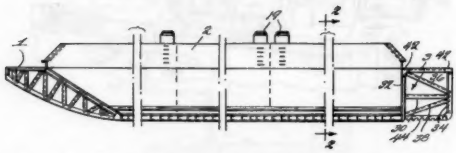
**3,672,319**
**LIQUID CARGO BARGE**
**Emile W. Platzer, P.O. Box 9788, Baytown, Tex.**
**Filed June 8, 1970, Ser. No. 44,524**
**Int. Cl. B63b *25/12***
**U.S. Cl. 114—74 R** **6 Claims**



A double skin liquid cargo barge having a liquid cargo compartment which is semi-self-supporting, with the sides of the compartment bearing the load. The top of the compartment is supported by "skin tension" and the bottom by a combination of "skin tension," center line longitudinal supports and transverse saddles which provide predetermined support to the compartment.

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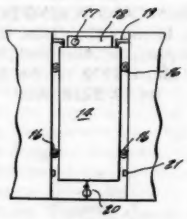
**3,672,320**
**SHIP FOR CONTAINERIZED CARGO**
**Ray W. Mikk, 5-7459 13th Avenue, Burnaby, British Columbia, Canada**
**Filed July 27, 1970, Ser. No. 58,532**
**Int. Cl. B63b**
**U.S. Cl. 114—74 R** **1 Claim**



A system of loading and unloading a tanker vessel, the system including a plurality of containers each of which contains oil or other fluid, the containers being readily dropped into vertically extending chambers formed on the vessel.

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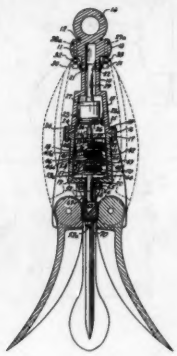
**3,672,321**
**ANCHORS WITH POWERED, MOVABLE FLUKES**
**Donald F. Tuel, 10621 West 57th Terrace, Shawnee, Kans.**
**Filed June 1, 1970, Ser. No. 42,042**
**Int. Cl. B63b *21/24***
**U.S. Cl. 114—208 R** **8 Claims**

Improved anchor constructions; anchors having each a plurality of powered movable flukes; power means for anchors with movable flukes operable to move said flukes from a fluke-stored position (where the flukes lie closely against the shank of the anchor) to an operating position with the flukes extending outwardly at substantially 90° from said shank to a collapsed or fluke-freeing position substantially 180° arcuate position away from the stowed position (whereby the flukes will have essentially no drag upon the bottom) one said power means comprising a hydraulic motor with suitable gearing to transmit power to said flukes; a second said power means comprising an electric motor with power therefrom also transmitted through suitable gearing to the flukes; a third said



power means comprising an hydraulic or pneumatic piston with the piston rod directly connected to the pivotal flukes; a next said power means comprising an electric solenoid power source driving a rod directly connected to the said pivotally movable flukes.

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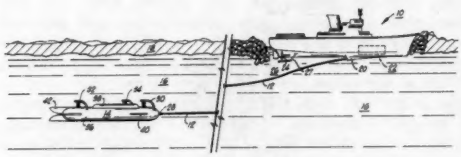
**3,672,322**
**METHOD AND APPARATUS FOR TOWING A SUBMERSIBLE BARGE**
**Harold E. Van Der Linde, New York, N.Y., assignor to Continental Oil Company, Ponca City, Okla.**
**Filed May 20, 1970, Ser. No. 38,952**
**Int. Cl. B63b *21/00***
**U.S. Cl. 114—235 B** **7 Claims**



A method of and apparatus for towing a submersible barge through bodies of water having ice formation thereon. The method consists of towing a submersible barge by means of a length of cable which is drawn from a point situated at an ice-free point on the skin of a towing barge or ice breaker. Further, the submersible barge includes provision for harmless striking of objects and/or rapid response ballast control in order to hold the barge at selected, trouble-free depths when the towing ice breaker is forced to progress at uneven rates of forward motion.

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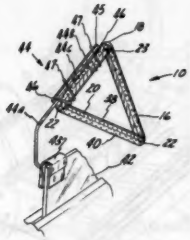
**3,672,323**
**EMERGENCY SIGN ASSEMBLY**
**Edward L. Hawes, 405 East Goulson, Hazel Park, Mich.**
**Continuation-in-part of Ser. No. 747,208, July 24, 1968, abandoned. This application Jan. 19, 1971, Ser. No. 107,721**
**Int. Cl. B60q**
**U.S. Cl. 116—28** **10 Claims**

A sign assembly for use with automobiles, trucks or the like to warn traffic that a vehicle ahead is disabled. The assembly includes a reflectorized, triangular sign which is collapsible for

storage and a clip and extension for fastening the sign to the upper edge of an automobile window and for positioning the



sign above the roof of the automobile so that it can be seen by approaching traffic.

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**ERRATUM**

For Class 116—70 see:
Patent No. 3,672,325

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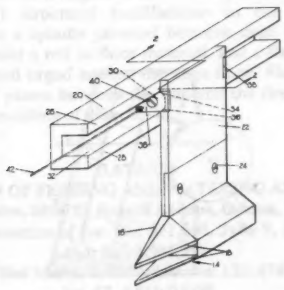
**3,672,324**
**RELEASABLE MELTING MEANS FOR MOVABLE FLUID NOZZLE EXTENSION**

**Paul E. Schnedler, Middletown, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio**

**Filed Dec. 28, 1970, Ser. No. 101,846**
**Int. Cl. B05c *11/06***
**U.S. Cl. 118—63** **3 Claims**



Fixed permanent mounting magnet having a face adapted to slidingly engage a plate of magnetic material which carries a jet nozzle extension. Releasable non-magnetic guide structure is provided to insure vertical location of the plate with respect to the magnet.

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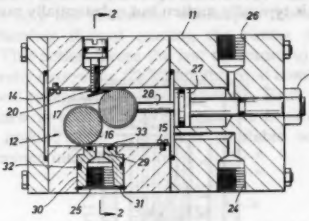
**3,672,325**
**TRANSDUCER WITH VISIBLE OUTPUT**

**Robert S. Harrah, P.O. Box 14410, Houston, Tex.**

**Filed June 12, 1970, Ser. No. 45,624**
**Int. Cl. G01l *19/12***
**U.S. Cl. 116—70** **20 Claims**

An indicator which discloses the state of a rolamite which includes a housing, a band wound in reverse bights about a pair of rollers to form a cluster. The cluster moves between two positions in the housing. The present invention incorporates a shield on the side of the housing, the shield including a pair of openings which permit visual inspection of the position of the rolamite. Preferably, the rollers are color coded to



enhance visual inspection. A transducer means operates the rolamite.

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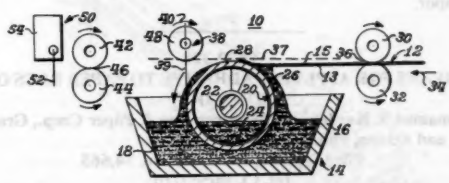
**3,672,326**
**METHOD AND APPARATUS FOR APPLYING LIQUID DEVELOPER TO COPY SHEETS**

**John J. Schulze, Prospect Heights, Ill., assignor to Addressograph-Multigraph Corporation, Mt. Prospect, Ill.**

**Filed Oct. 13, 1970, Ser. No. 80,381**
**Int. Cl. G03g *13/00***
**U.S. Cl. 118—8** **9 Claims**



Apparatus and method for developing electrostatically imaged copy sheets by the application of a liquid developer to the imaged surface thereof includes a cylinder mounted for rotation in a predetermined direction and at a predetermined speed while being dipped into a supply of developer liquid. A copy sheet is passed over the cylinder in the direction of rotation of the latter with the imaged surface of the copy sheet in contacting relation with the liquid coated surface of the cylinder. A sensor downstream of the cylinder along the copy sheet path detects the leading edge of the copy sheet and in response thereto reverses the direction of rotation of the cylinder until such time as the trailing edge of the sheet passes the sensor. In a preferred embodiment, the cylinder includes an internal auger which stirs the supply of developer liquid during rotation of the cylinder to maintain toner particles in the developer liquid in suspension. The outer surface of the cylinder includes a plurality of glass beads, each having a diameter in the range of 0.002 to 0.010 inches for carrying a predetermined quantity of developer liquid for application to the copy sheets.

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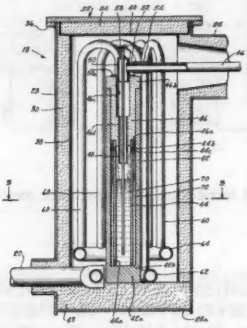
**3,672,327**
**VAPORIZATION OF METAL FOR VACUUM METALIZING**

**John M. Roblin, Cleveland; Frank J. Cole, Parma, and William A. Reed, West Richfield, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio**

**Filed Oct. 31, 1966, Ser. No. 590,921**
**Int. Cl. C23c *13/12***
**U.S. Cl. 118—48** **15 Claims**

Vaporizing apparatus and method for the vaporization of metal for vacuum deposition. A relatively thin shell of liquid metal to be vaporized is provided such as through inner and outer concentric vessels which communicate with each other.

The thin shell of liquid is heated and boils and evaporates to provide metal for vaporization. The thin shell of liquid is generally formed within the space between the inner and outer concentric vessels. The space within the inner vessel contains liquid which is typically molten but substantially non-boiling.



The boiling shell of liquid fills the space between the inner and outer containers so as to provide substantially constant volume of metal for vaporization. Baffle means are provided for removing droplets of liquid normally from within the vapor.

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**3,672,328**

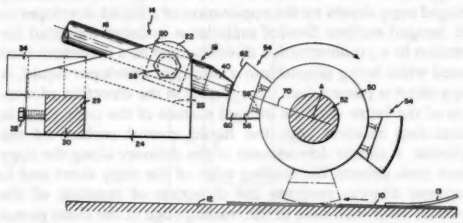
**MEANS FOR APPLYING ADHESIVE TO PAPER BAGS OR THE LIKE**

**Emanuel S. Kardon, c/o American Bag & Paper Corp., Grant and Ashton, Philadelphia, Pa.**

**Filed Sept. 23, 1970, Ser. No. 74,665**

**Int. Cl. B05c *1/16***

**U.S. Cl. 118—221** **7 Claims**



Means for applying adhesive to paper bags or the like in which a rotating cylinder carries an arcuate applicator member which intermittently comes into contact with a valve controlled adhesive dispenser head to receive adhesive therefrom and subsequently transfer it to a paper bag or the like moving along a conveyor bed.

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**3,672,329**

**DEVELOPING DEVICE FOR ELECTROSTATIC DUPLICATORS**

**Yorio Yamanoi, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

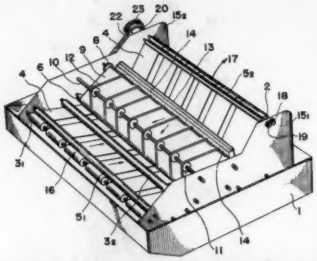
**Filed May 6, 1970, Ser. No. 34,994**

**Claims priority, application Japan, May 16, 1969, 44/45131**

**Int. Cl. G03g *13/00***

**U.S. Cl. 118—637** **3 Claims**

A developing device comprising a continuous belt for carrying exposed photosensitive paper, an electrically conductive belt supported to be driven at the same speed in parallel spaced relationship therewith through a developing solution. A number of string-like insulating members are supported on the surface of the conductive belt facing the surface of the carrying belt. The insulating members and the conductive belt are



driven into contact with a cleaning member mounted adjacent thereto.

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**3,672,330**

**APPARATUS FOR DEVELOPING A LATENT ELECTROSTATIC IMAGE**

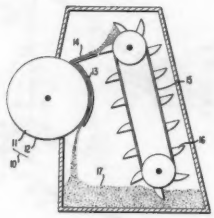
**Masamichi Sato, and Isoji Takahashi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Continuation of Ser. No. 694,467, Dec. 29, 1967, abandoned. This application June 4, 1970, Ser. No. 41,767**

**Claims priority, application Japan, Dec. 29, 1966, 42/437**

**Int. Cl. G03g *13/00***

**U.S. Cl. 118—637** **7 Claims**



A cascade apparatus for developing a latent electrostatic image which comprises flowing a cascade developer between the upper surface of a photoconductive insulating layer containing a latent electrostatic image and a flexible developing electrode positioned so as to cover said layer by gravity and developing the latent electrostatic image while maintaining a constant and small space between said developing electrode and latent electrostatic image surface of the photoconductive insulating layer.

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**3,672,331**

**DOG TOILET**

**Charles Brody, and Rhoda Sharon Brody, both of 18-65 211th Street, Apt. 5C, Bayside, N.Y.**

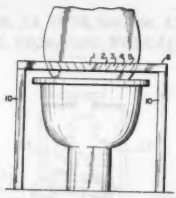
**Filed March 27, 1970, Ser. No. 14,080**

**Int. Cl. A01k *15/00***

**U.S. Cl. 119—1** **1 Claim**

A platform with legs and a central opening may be placed over a conventional toilet bowl so that a dog or other domestic

animal can use the facility without coming in physical contact with the toilet. The central opening comprises a plurality of



removable concentric ring shaped inserts for accomodating animals of different sizes.

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**3,672,332**

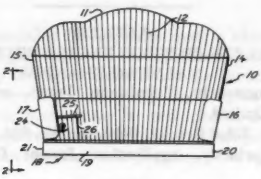
**DISPOSABLE FLOOR DISPENSER FOR BIRD CAGE**

**Hugh W. MacLeod, 2244 East Pender Street, and Gardner J. MacLeod, 2741 Venables Street, both of Vancouver, British Columbia, Canada**

**Filed Dec. 14, 1970, Ser. No. 97,650**

**Int. Cl. A01k *31/00***

**U.S. Cl. 119—17** **10 Claims**



A disposable floor dispenser or accessary for fitting in a bird cage without structural modification to the cage. The dispenser has a spindle jammed between cage sidewalls to rotatably mount a roll of floor material, and a flap extending downwards and urged against the cage floor. Floor material from the roll passes between the flap and the floor, reducing inadvertent unrolling of the roll.

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**3,672,333**

**METHOD OF FEEDING AND WATERING ANIMALS**

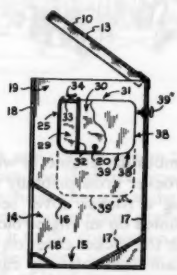
**Marcus L. Bates, 6904 N. Russell Avenue, Odessa, Tex.**

**Continuation of Ser. No. 831,600, June 9, 1969, Pat. No. 3,581,711**

**Filed March 5, 1971, Ser. No. 121,474**

**Int. Cl. A01k *05/00***

**U.S. Cl. 119—51.5** **4 Claims**



Method of automatically feeding and watering animals by the provision of apparatus having a main housing within which there is disposed a plurality of pivotally mounted upwardly opening spaced apart enclosures, with each enclosure including a food containing chamber and a water containing chamber therein. Overlying the chambers there is disposed a water conveying means comprised of individual sloped troughs, each arranged in series relationship with respect to one another, so as to intercept and convey water from a first enclosure to a last enclosure, whereupon the water fills the water chamber thereof causing the center of gravity to change. This action-forces the last enclosure to rotatably invert, thereby depositing the water and food contained therein into a food receptacle or feeding trough. Each of the enclosure means is sequentially inverted in a similar manner, thereby making food and water available to animals at predetermined intervals of time.

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**3,672,334**

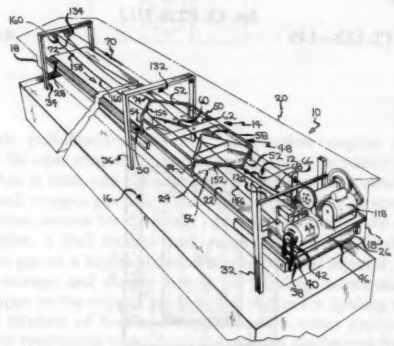
**APPARATUS FOR DISTRIBUTING ANIMAL FEED**

**Lyle W. Scheppele, Dubuque, Iowa, assignor to Toledo Stamping & Manufacturing Co., Toledo, Ohio**

**Filed March 2, 1970, Ser. No. 15,782**

**Int. Cl. A01k *05/00***

**U.S. Cl. 119—52 B** **12 Claims**



A cattle feeder is provided with an improved drive arrangement. The feeder includes a conveyor belt which carries feed and a carriage movable on the belt to discharge the feed off the sides of the belt. The improved drive arrangement for the carriage includes a sprocket at one end of the conveyor engaging a link chain connected to the carriage. Guides adjacent the sprocket maintain the chain properly oriented with respect thereto. One end of the chain is connected directly to the carriage and the other end preferably is connected to the carriage through a length of cable which extends around an idler pulley at the opposite end of the conveyor belt.

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**3,672,335**

**METHOD AND APPARATUS FOR GATHERING AND CONFINING LIVE POULTRY**

**Dickerson H. Sanders, 170 Stanton Way, Athens, Ga.**

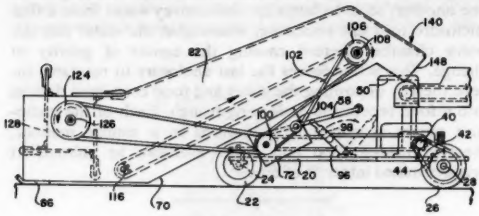
**Filed Oct. 16, 1970, Ser. No. 81,377**

**Int. Cl. A01k *29/00***

**U.S. Cl. 119—82** **25 Claims**

A mobile self-propelled gathering device is manually guided through an area having live birds therein. Pushing means is provided at the forward end of the gathering device and engages the birds from above and pushes the birds rearwardly onto a conveyor means which extends upwardly and rearwardly for conveying the birds away from the pushing means. The birds are discharged at the upper rear portion of the conveyor means downwardly onto a generally horizontally ex-

tending conveyor portion which in turn conveys the birds to a further conveyor portion extending to a vehicle from whence



the birds are removed from the conveyor portion and placed in suitable shipping contains on the vehicle.

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**3,672,336**

**HEAT GENERATOR OF THE SMOKE-TUBE TYPE**

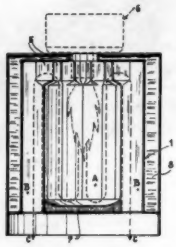
**Giuseppe Joannes, Rivoli, Italy, assignor to Gruppo Finanziario Termico Fin-Term S.p.A, Turin, Italy**

**Filed May 26, 1970, Ser. No. 40,655**

**Claims priority, application Italy, May 26, 1969, 51998 A/69**

**Int. Cl. F22b 7/12**

**U.S. Cl. 122—149** **4 Claims**



A heat generator of the smoke-tube type which includes a furnace and a plurality of smoke tubes. Both the furnace and the tubes are made of a single metal sheet which is folded. The tubes are arranged circularly around the furnace or a part of the furnace. The shape of the tubes is such that there is communication between the tubes and the furnace for reversing the flow of the smoke. The tubes are of a constant or of a variable cross section.

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**3,672,337**

**HEATING VESSEL**

**Gustav Ospelt, Vaduz, St. Johanner, and Wolfgang Kunkel, Triesen, both of Liechtenstein, assignors to Gustav Ospelt Hovalwerk AG, Vaduz, Liechtenstein**

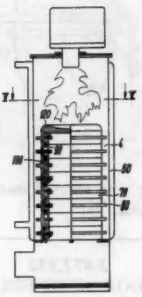
**Filed July 6, 1970, Ser. No. 52,423**

**Int. Cl. F22b 13/02**

**U.S. Cl. 122—156** **2 Claims**

A furnace having a fireplace surrounded by a substantially cylindrical water boiler shell for burning of liquid or gaseous fuel by means of a burner joining a fireplace, comprising a water boiler shell, a burner disposed at one end of the water boiler shell on the end side of the latter.

At least one annular channel is provided and a hood is arranged at one ed of the furnace and feeding off flue-gases from the end of the water boiler shell disposed opposite the burner in axial direction of the furnace through the at least one channel to the other end of the furnace. At least one wall of the annular channel has a plurality of annular- or screw-like indentations and projections and at least one wall of the annular chan-



nel engages a water tank connected for water communications with the water boiler shell.

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**3,672,338**

**INTERNAL COMBUSTION ENGINE WITH OVERHEAD VALVE MECHANISM**

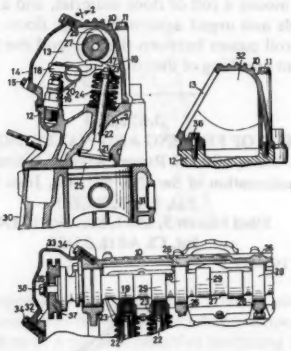
**Yuichi Yamanouchi, Yokohama, Japan, assignor to Isuzu Motors Limited**

**Filed Dec. 19, 1969, Ser. No. 886,528**

**Claims priority, application Japan, Dec. 27, 1968, 43/114134**

**Int. Cl. F01l 1/18, 1/20**

**U.S. Cl. 123—90.27** **1 Claim**

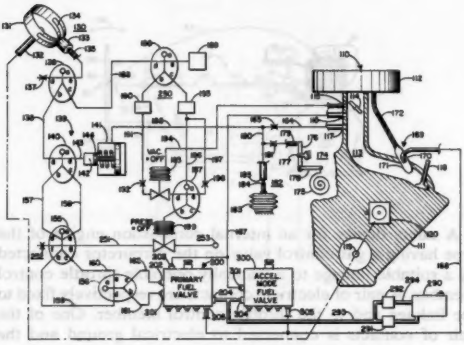


An internal combustion engine in which overhead valves are operated by rocker arms pivotally mounted on lash adjusters, comprising a rocker cover secured by bolts to a cylinder head mounted on an engine block, bearing members integrally cast with the rocker cover on the inner wall of said rocker cover, a cam-shaft rotatably carried on said bearing members, manually controllable lash adjusters mounted on the cylinder head, wherein the valves are operated by moving the rocker arms on said lash adjusters through cam lobes provided on said camshaft. The rocker cover is provided with two openings one at one side and one at the forward end thereof covered by removable covers.

## 3,672,339
## FUEL INJECTION APPARATUS

Jeffrey M. Lazar, Warminster, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 24, 1970, Ser. No. 13,633
Int. Cl. F02m 7/00; F02d 31/00
U.S. Cl. 123—119 R 7 Claims

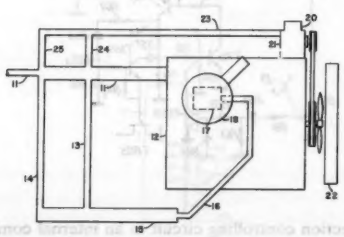



A fluidically controlled fuel injection system wherein fuel is delivered to the engine in pulses, the repetition rate of the pulses corresponding to engine speed, and the duration of the pulses being determined primarily by engine manifold vacuum. Pneumatic means may be provided to compensate the fuel injection system for variations in air temperature, engine temperature, and atmospheric pressure.

## 3,672,340
## EXHAUST FEEDBACK AND CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Georg A. Bomba, Concord, Calif., assignor to Fred J. Walker, Berkeley, Calif., a part interest

Filed May 18, 1970, Ser. No. 38,278
Int. Cl. F02m 25/06
U.S. Cl. 123—119 A 18 Claims

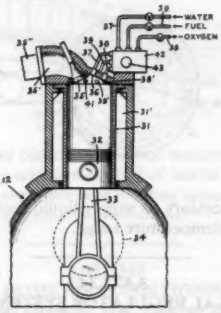


An exhaust feedback and control system for internal combustion engines. At least one feedback pipe is connected at one end to the engine exhaust pipe and at the other end to the engine intake for diverting a fractional portion of the engine exhaust and delivering it to the combustion chamber. An air pipe is connected to the engine air pump for delivering air under pressure through at least one passage to the exhaust pipe at a location in juxtaposition with the feedback pipe for diluting the fractional portions of diverted exhaust with air. The arrangement also provides for cooling of the exhaust and for damping pressure variations in the feedback line. A muffler-filter is interposed between the exhaust pipe and tail pipe.

## 3,672,341
## AIR POLLUTION-FREE INTERNAL COMBUSTION ENGINE AND METHOD FOR OPERATING SAME

Richard D. Smith, Palo Alto, and Dale A. Furlong, Sunnyvale, both of Calif., assignors to Combustion Power Company, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. Nos. 796,089, Feb. 3, 1969, and Ser. No. 820,941, May 1, 1969. This application July 30, 1970, Ser. No. 59,571
Int. Cl. F02d 19/00; F02b 33/00; F02c 3/20
U.S. Cl. 123—119 E 34 Claims




An air pollution-free internal combustion engine and method for operating such engine are provided in which the engine has at least one cylinder, an exhaust port and exhaust valve, fuel, oxygen gas and water spray injectors, a piston in the cylinder, means for cyclically opening and closing the exhaust valve, a fuel storage and supply system for feeding hydrogen gas or a liquid hydrocarbon to the fuel injector, an oxygen storage and supply system for feeding substantially pure oxygen to the oxygen gas injector, means for igniting the injected mixture of fuel and oxygen, and a water recovery system for recovering water from the exhaust discharged from the cylinder and for recycling the recovered water to the water spray injector.

In a typical engine cycle, the exhaust valve is closed prior to completion of the exhaust stroke to entrain some exhaust gas in the cylinder as a working fluid. Oxygen is then injected into the cylinder after the exhaust valve closes and before the piston reaches top dead center on the exhaust stroke, and while relatively low pressures exist in the cylinder. Fuel is next progressively injected under pressure into the oxygen contained in the cylinder so that that fuel burns progressively as it is injected to preclude knocking problems. After combustion is substantially completed, the exhaust valve opens just before the piston reaches bottom dead center on the power stroke whereupon water is injected into the cylinder to cool the cylinder walls, piston, dome, combustion chamber wall and exhaust gas. A portion of the exhaust gas is then discharged from the cylinder through the exhaust port on the exhaust stroke.

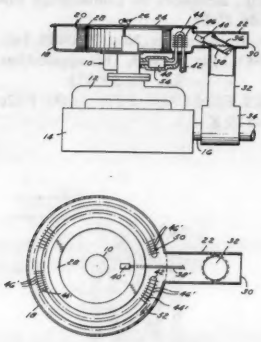
## 3,672,342
## SYSTEM FOR CONTROLLING AIR AND FUEL TEMPERATURE

William K. Ojala, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sept. 2, 1970, Ser. No. 68,836
Int. Cl. F02m 31/08
U.S. Cl. 123—122 B 2 Claims

Liquid fuel on its way to the carburetor passes through a small heat exchanger located in the air cleaner downstream of an air temperature control mechanism that mixes heated and

ambient air to produce air having a temperature within a relatively narrow range. The heat exchanger heats or cools the



liquid fuel as necessary to supply liquid fuel having approximately the same temperature range.

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**3,672,343**

## CENTRIFUGAL REGULATOR SYSTEM FOR FUEL-INJECTION COMBUSTION ENGINES

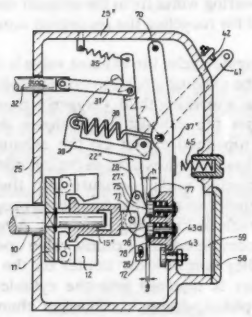
**Josef Biechl, Sindelfingen, and Karl Konrath, Ludwigsburg-Hoheneck, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**

**Filed Oct. 14, 1970, Ser. No. 80,684**

**Claims priority, application Germany, Oct. 31, 1969, P 19 54 834.6**

**Int. Cl. F02d 1/04**

**U.S. Cl. 123—140 MC** **5 Claims**



A centrifugal regulator for an internal combustion engine having a fuel injector controllable by actuation of a control rod. Movement of the governor sleeve upon a variation in rpm is transferred to a spring-biased rocker arm, which is pivoted on an intermediate lever between a fixed pivot thereof and a link connecting it with the control rod. Various types of relationship between fuel injection rate and rpm are obtained by means of differently placed adjustable or resilient stops provided on a spring-urged support arm and on which the rocker arm may swing when transferring sleeve movement to the intermediate lever and the control rod.

**3,672,344**

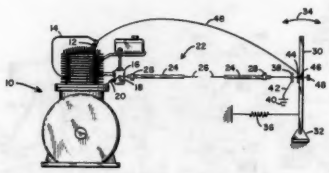
## SAFETY DEVICE FOR AN INTERNAL COMBUSTION ENGINE

**Robert V. Albertson, 2100 Shady Wood Road, Minneapolis, Minn.**

**Filed Sept. 11, 1970, Ser. No. 71,600**

**Int. Cl. F02b 77/08**

**U.S. Cl. 123—198 DB** **6 Claims**



A safety device for an internal combustion engine of the type having a gas control valve on the carburetor connected by a suitable linkage to a manually operable throttle control member. A pair of electrical contacts are respectively fixed to the linkage and to the throttle control member. One of the pair of contacts is connected to electrical ground and the other of the pair of contacts is connected to the ignition of the internal combustion engine. A suitable spring normally returns the valve to a closed position when the throttle control member is released. If the linkage should stick with the flow control valve in the open position, when the throttle control member is released, the contacts close to ground the ignition and stop the engine.

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**3,672,345**

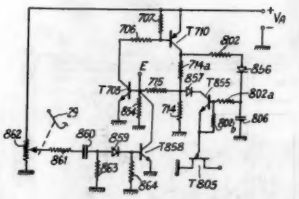
## ELECTRONIC INJECTION-CONTROLLING SYSTEM FOR INTERNAL COMBUSTION ENGINES

**Louis A. Monpetit, L'Etang-la-Ville, France, assignor to Societe des Procedes Modernes d'Injection Sopromi, Les Mureaux, France**

**Filed April 2, 1970, Ser. No. 25,094**

**Int. Cl. F02b 3/00, 33/00**

**U.S. Cl. 123—32 EA** **1 Claim**

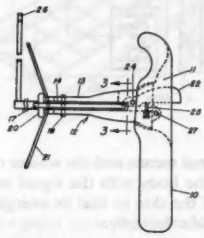


The injection controlling circuit in an internal combustion engine of a known type comprising a flip-flop controlled by the rotation of the engine so as to generate at predetermined moments injection-controlling signals, in association with a circuit producing end-of-injection signals in accordance with the operative parameters of the engine, means are provided to terminate the injections whenever there is a too sudden modification in the admission of fuel to the engine. To this end, the acceleration pedal controls the slider of a potentiometric voltage divider and a sudden shifting of said slider charges a condenser which prevents operation of the flip-flop. This is accomplished for by the application of a pulse by the transiently charged condenser to the base of a transistor which is thus rendered conductive and which grounds the input of the flip-flop through its collector-emitter circuit connected between said input and ground.

## 3,672,346
## ARCHERY BOW STRING DRAW AND RELEASE DEVICE

Robert D. Plumb, Le Roy, Minn.

Filed Sept. 30, 1970, Ser. No. 76,861
Int. Cl. F41c *19/00, 11/02*
U.S. Cl. 124—35 10 Claims

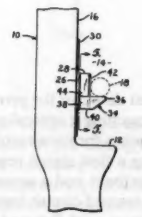


An archery bow string release is provided which includes a string draw and release mechanism which is pivotally mounted to a handle member by a universal pivot such as a ball joint. The bow string draw and release device has only one pivoted arm that is biased into engagement with an immovably fixed jaw so as to retain a bow string therebetween. The fixed jaw has a straight jaw that permits a bow string to move when released in a forward direction without any interruptions. The biased jaw has a forward end portion that presents the only impediment to a drawn bow string.

## 3,672,347
## ARROW REST

Holless W. Allen, Billings, Mo.

Filed Dec. 3, 1970, Ser. No. 94,806
Int. Cl. F41b *5/00*
U.S. Cl. 124—41 5 Claims

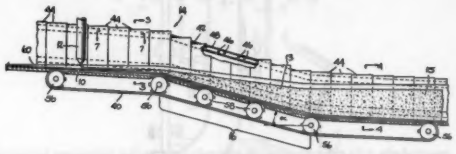


The shaft of an arrow is supported in the sight window of an archery bow by an arrow rest comprising a flexible finger which shifts laterally as it is engaged by the feathers of the arrow after release. The finger is attached to a bendable spacer tab and is movable therewith to a position desired by the archer where the shaft of the arrow is aligned with the path of the bowstring. The tab is formed of sufficiently heavy plate stock to be rigid and remain in the desired position under lateral force that may be applied thereto as the arrow is shot.

## 3,672,348
## APPARATUS FOR REGULATING THE UPPER SURFACE CONTOUR OF EXPANDED CELLULAR PRODUCTS

Charles Ferstenberg, Paramus, N.J., assignor to Tenneco Chemicals, Inc., New York, N.Y.

Division of Ser. No. 750,034, Aug. 5, 1968, Pat. No. 3,560,599.
This application April 27, 1970, Ser. No. 41,659
Int. Cl. B29f *1/00*
U.S. Cl. 425—364 4 Claims

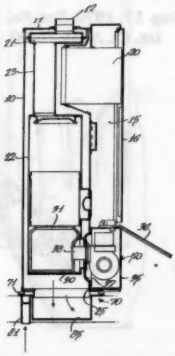


Control of upper contour of foamed materials formed in an open top mold by selective control of lateral pressure to the rising foam and a conveyor type molding apparatus for achieving this control in continuous production.

## 3,672,349
## MOBILE HOME AIR CONDITIONING UNIT

Ray Derringer, Port Edwards, Wis., assignor to Preway Inc.

Filed Oct. 5, 1970, Ser. No. 77,809
Int. Cl. F24h *3/02*
U.S. Cl. 126—110 AA 8 Claims



A mobile home air conditioning unit having a mounting structure whereby the unit can be mounted in a mobile home with a base assembly oriented relative to the circulating air duct work and an outside air intake and with the unit casing and base assembly being constructed for mounting of the unit onto the base assembly in one of several different rotatively oriented positions as required for proper location and orientation of the unit in the mobile home. Additionally, when the unit is a furnace, a sealed burner box therefor carries a burner assembly and coacts with the base assembly and the furnace structure whereby the burner box can be interchanged simply, dependent upon use of gas or oil fuel by mounting of a burner box having the desired burner assembly.

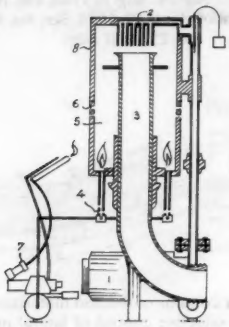
## 3,672,350
## GAS WATER HEATER

Andre Denis, 23 Rue de Coq., Marseille, France

Filed May 19, 1970, Ser. No. 38,776
Int. Cl. F24h *4/00*
U.S. Cl. 126—350 1 Claim

A gas-operated water heater comprises a housing and an upright open-ended mixing tube defining a combustion

chamber in the housing. The combustion chamber has gas burners, and the combustion product gases are drawn into the mixing tube by lowering of pressure therein caused by directing a spray of finely-divided water particles down the tube. Heat exchange between the combustion gases and the water takes place in the tube, and both water and gases flow out at the lower end of the tube.



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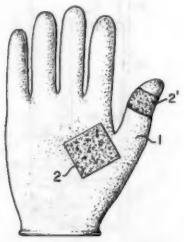
### 3,672,351
### DISPOSABLE BLOOD TEST DEVICE

**Richard W. Ubersax, 1921 Greve Avenue, Spring Lake Heights, N.J., and Andrew Truhan, R.D. #3, Box 392 T, Somerset, N.J.**

**Filed Aug. 17, 1970, Ser. No. 64,509**
**Int. Cl. A61b** *10/00*
**U.S. Cl. 128—2 G** **4 Claims**



A disposable device for testing the contents of accessible body cavities is provided by a glove of impermeable material having a pad of bibulous material impregnated with a test composition affixed to the thumb of the glove in a position contactable by the tip of any of the fingers thereof. The test pad may be affixed either to the base of the thumb of the glove or to the inner surface of the distal end thereof or to both positions. When the pad of bibulous material is impregnated with a blood diagnostic composition the device is useful in the detection of occult blood in accessible body cavities such as the rectum.

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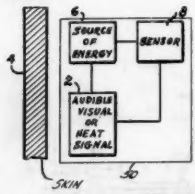
### 3,672,352
### IMPLANTABLE BIO-DATA MONITORING METHOD AND APPARATUS

**George D. Summers, 8 Park Overlook Court, Bethesda, Md.**

**Filed April 9, 1969, Ser. No. 814,760**
**Int. Cl. A61f** *5/00*
**U.S. Cl. 128—2 R** **18 Claims**

A system for monitoring a condition of a body function or organ or device implanted within a body includes a sensor or transducer responsive to that condition or a change in it connected to a signal means capable of producing an audible, visual or heat signal of variable intensity indication to control the energization of the signal means from a source of energy.




The sensor and signal means and the source of energy may be implanted within the body with the signal means sufficiently near the surface of the skin so that its energized state may be detected from outside the body.

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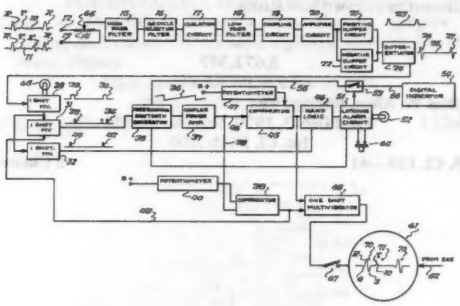
### 3,672,353
### ECTOPIC HEARTBEAT DETECTOR

**Edward A. Crovella, Snyder, N.Y., and C. Verne Barfield, Mableton, Ga., assignors to Cardiac Electronics, Inc., Clarence, N.Y.**

**Filed Dec. 23, 1969, Ser. No. 887,661**
**Int. Cl. A61b** *5/04*
**U.S. Cl. 128—2.06 A** **1 Claim**



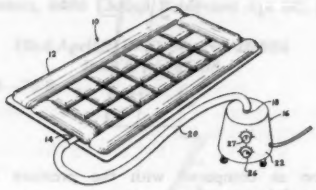
A critical ectopic beat detector for providing a warning that an ectopic beat is approaching a critical portion of a heartbeat including first circuit means for monitoring a heartbeat including means for providing a first signal representative of a normal portion of said heartbeat and a second signal representative of an ectopic beat, second circuit means for measuring the time relationship between said fist and second signals, and third circuit means for providing a third signal in the event said time reaches a predetermined value to thus provide a warning that said ectopic beat is approaching said critical portion of said heartbeat, including instrumentation for presetting said predetermined value into the circuit so that the equipment may be utilized with equal facility for different patients having different heartbeat patterns, and also including an arrangement for monitoring the heartbeat on a scope and placing on the scope an indication that the ectopic beat has approached within a predetermined time of said predetermined critical portion of the heartbeat so as to enable an accurate visual observation of the change in pattern of the heartbeat.

**3,672,354**

## REST-INDUCING DEVICE

**Robert L. Weber, New Canaan, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.**

**Filed Sept. 4, 1970, Ser. No. 69,834**
**Int. Cl. A61h *1/00***
**U.S. Cl. 128—33** **3 Claims**



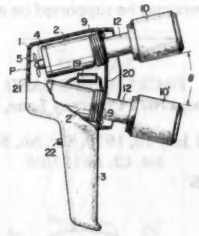
Air pump gives a pulse cycle at human heartbeat frequency to air mattress to simulate the prenatal womb experience to an infant supported thereon.

**3,672,355**

## ELECTRO-MASSAGER

**Hiroshi Ogawa; Sigeto Yamane; Hisasi Nakagawa, and Akinari Uchida, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Dec. 28, 1970, Ser. No. 101,687**
**Claims priority, application Japan, Dec. 26, 1969, 44/104403**
**Int. Cl. A61h *1/00***
**U.S. Cl. 128—36** **10 Claims**



An electro-massager comprising a casing having a handle, a pair of motors disposed in the casing for actuating a pair of vibrating heads, each including an eccentric balance weight therein, which are, respectively, rotatably coupled with the motors through flexible coupling means, whereby the eccentric balance weights are subjected to rotation in the vibrating heads thereby to both vibrate and massage the objective portion of the body inserted therebetween.

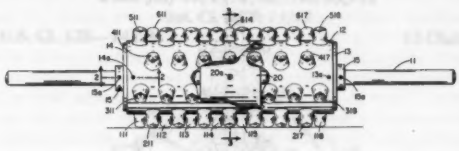
**3,672,356**

## ABDOMINAL MUSCLE EXERCISE DEVICE

**Saul Possick, 14 Boylston Street, Randolph, Mass.**

**Filed Dec. 10, 1970, Ser. No. 96,834**
**Int. Cl. A61h *15/00***
**U.S. Cl. 128—57** **3 Claims**

An abdominal muscle exercise device comprising a cylinder on a shaft adapted to be held by the hands. The surface of the cylinder is covered with protrusions which exercise the abdominal muscles when the device is rolled over the abdomen.

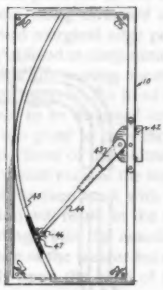


**3,672,357**

## MASSAGE APPARATUS

**William G. Ferguson, 2518 Broad Avenue, Altoona, Pa.**

**Filed Oct. 20, 1970, Ser. No. 82,427**
**Int. Cl. A61h *7/00***
**U.S. Cl. 128—49** **1 Claim**



A massage apparatus having a frame with supporting means adapted to position the frame in substantially parallel relationship with respect to and over a bed, a massage applicator, power means to move the applicator and guide means on the frame defining a prescribed path through which the applicator may move with respect to the frame to provide massage treatment to a person lying on the bed below the frame.

**3,672,358**

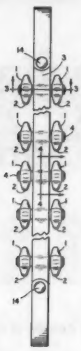
## MASSAGE DEVICE

**Eugene J. Majewski, 121 North Elmore Avenue, Park Ridge, Ill.**

**Filed Dec. 2, 1970, Ser. No. 94,416**
**Int. Cl. A61h *11/00***
**U.S. Cl. 128—58** **1 Claim**

A massage device consisting of a plurality of rollers having projections, the rollers being mounted for rotation on a carrier, rotation occurring when the rollers are placed in contact with a portion of the body to be massaged and the carrier is moved in a direction normal to the axis of rotation of said rollers, the said projections preferably being of resilient material

although firm enough to press into the fleshy and muscular portions of the body to produce massaging action when



reciprocated over a portion of the body causing the rollers to rotate.

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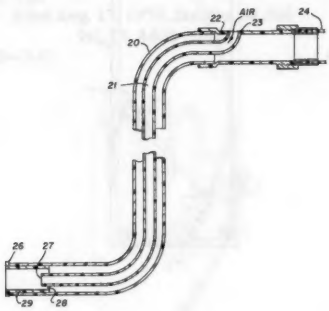
**3,672,359**
**WHIRLPOOL BATH ATTACHMENT**
**Charles Krohn, 43-23 Colden Street, Flushing, N.Y.**
**Filed July 28, 1970, Ser. No. 58,946**
**Int. Cl. A61h 9/00**
**U.S. Cl. 128—66** **6 Claims**



Substantially coaxial conduits provide a jet of water from the outer conduit along with relatively large bubbles from the inner conduit. The emission end of the inner conduit terminates upstream the emission end of the outer conduit, and there is a restriction in the outer conduit upstream the end of the emission inner conduit.

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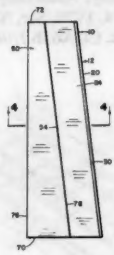
**3,672,360**
**SPINAL AREA BACK SUPPORTER AND MASSAGING DEVICE**
**Arthur C. Langhammer, 901 North Linn Street, Glenwood, Iowa**
**Filed June 1, 1970, Ser. No. 42,302**
**Int. Cl. A61h 7/00**
**U.S. Cl. 128—67** **10 Claims**

A central area back supporter and massaging device having an elongated and resilient central supporting portion, an intermediate means or rear portion attached to the central supporting portion, the rear portion being adapted to engage other parts of the back other than the vertically elongated spinal depression area, the central supporting portion protruding so far forwardly of the remainder of the device that when a user's back presses thereagainst substantial excess pressure will be felt by the user in the areas of the sides of the vertical spinal



depression as compared with the pressure against the remainder of the user's back.

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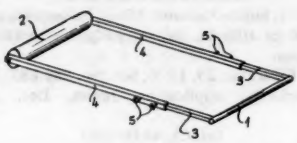
**3,672,361**
**EXERCISING APPARATUS**
**Aime Fourneron, 5, rue Verguin, Roussillon, France**
**Filed Jan. 5, 1971, Ser. No. 104,089**
**Claims priority, application France, Jan. 5, 1970, 7001307**
**Int. Cl. A61f 5/00**
**U.S. Cl. 128—71** **18 Claims**



An exercising device particularly for stretching the vertebral column which includes a bar grippable by the user and a second bar or surface engageable in the region between the users thighs and torso, the spacing between the two bars may be variable. The bars may be supported on a table.

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**3,672,362**
**FACE LIFTING BAND**
**Lorraine A. Basche, 17071 Courtney Lane, Huntington Beach, Calif.**
**Filed July 10, 1970, Ser. No. 53,931**
**Int. Cl. A61f 5/08**
**U.S. Cl. 128—76 B** **4 Claims**

A face lifting band disposable on the head and hideable under the natural hair of the wearer or a wig or other hair covering and serving to immediately tighten the facial skin and remove lines therefrom and, operating over a period of time, to strengthen the facial muscles. The band has side and front portions formed of highly elastic webbing having on its inner face an adhering velour-like or velvet-type material. The back of the band is an insert inclining downwardly to a point and formed of two pieces of lower elasticity than the main portion of the band. The insert pieces are joined together at the center back and to the ends of the main webbing at an angle to the

axes of the inserts and the main webbing. The inserts may have a lesser width than the main webbing whose corners thereat are bent over and sewn to provide a smooth contour. Anchoring means for the back of the band may be placed on the inside surface thereof.

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**3,672,363**

**FACIAL DEVICE AND METHOD OF USING THE SAME**

George Masters, 4400 Lindell Boulevard Apt 6C, St. Louis, Mo.

Filed April 9, 1970, Ser. No. 26,886
Int. Cl. A61f 5/08
U.S. Cl. 128—76 B 2 Claims

A device for lifting and spreading the skin on a subject's face comprising a plurality of skin attachment means, elongated strap means secured at one end thereof to said skin attachment means, and coupling means secured to the opposite end of said strap means adapted to couple said device with another proximate cooperating facial device.

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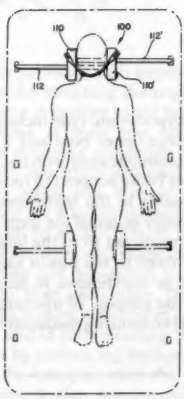
**3,672,364**

**ORTHOPEDIC TENSION UNIT**

Philip A. Rankin, 903 E. Holaway Drive, Tucson, Ariz.

Filed Jan. 28, 1971, Ser. No. 110,722
Int. Cl. A61f 13/00
U.S. Cl. 128—134 10 Claims



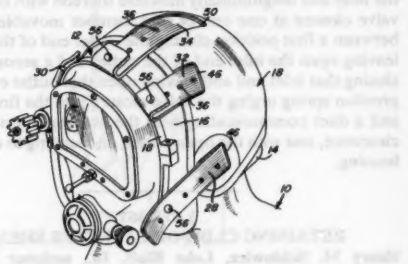
This can be succinctly defined as an anatomical, compressible weight immobilizer, comprising orthopedic strap tension weights which are adapted to immobilize a portion of an injured patient's anatomy against disposition or dislocation, while the patient is reclining. To the portable orthopedic strap tension weighted components is secured a cervical chin strap supplement, in one embodiment. The unit with attachments is applicable to a stretcher or hospital bed or operating table and may be used alternately in the transport of the patient or in the retention of the patient in position for examination, operation or ambulatory movement.

**3,672,365**

**BAND MASK HELMET**

Bevly Boone Morgan, 3319 Braeman Road, Santa Barbara, Calif.

Filed July 10, 1970, Ser. No. 53,912
Int. Cl. B63c 11/12
U.S. Cl. 128—141 R 13 Claims



A stiff forwardly and downwardly opening head protective helmet to be utilized by a diver provided with a face mask. The helmet includes forward marginal edge portions provided with peripherally spaced openings and is thus adapted to be utilized in conjunction with a head sling engaged with the back of the head of the wearer of the helmet beneath the latter and provided with forwardly extending tension members whose forward ends include structure for removable attachment to corresponding peripheral portions of the associated face mask, the tension members being threaded through the openings formed in the forward marginal edge portions of the helmet. When the helmet is utilized in conjunction with the aforementioned head sling and the tension members of the sling are constructed of elastic material, the head sling may be provided with portions thereof to be disposed inwardly of the helmet and of dimensions too great to pass through the openings in the marginal edge portions of the helmet and in this manner attachment of the forward ends of the tension members to the marginal portions of the face mask with the tension members in tensioned condition will result in the tension members not only serving to yieldingly bias the associated face mask rearwardly against the face of the wearer but also to yieldingly bias the helmet forwardly upon the head of the wearer of the associated face mask.

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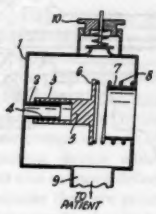
**3,672,366**

**VALVE AND CIRCUIT FOR INTERMITTENT POSITIVE PRESSURE BREATHING APPARATUS**

Geoffrey Barnett Burchell, 10 Nelmes Road Hornchurch, Essex, and Richard William Victor Morel, Hendron, Hitthen Hutch Lane, Kent, both of England

Filed Sept. 29, 1967, Ser. No. 671,810
Claims priority, application Great Britain, Nov. 28, 1966, 53,251/66
Int. Cl. A62b 7/00
U.S. Cl. 128—145.8 27 Claims




An apparatus for producing intermittent positive pressure comprises a high-pressure nutrient gas supply, a valve device

connected to the supply and operable by the gas, and a conduit connected downstream of the valve device to lead gas under low pressure towards a patient or a space between a breathing bag and a surrounding casing. The valve device controls gas flow through the conduit and opens and closes with relatively sudden pressure change. The valve device can include a housing having a tubular, high-pressure gas inlet and a low-pressure gas outlet, a member in the housing co-axial with the inlet and longitudinally movable thereon with clearance, a valve closure at one end of said member movable therewith between a first position closing the outlet end of the inlet and leaving open the inlet end of the outlet and a second position closing that inlet end and leaving open that outlet end, a compression spring urging the valve closure into the first position, and a duct communicating with the housing interior and the clearance, and with the open outlet, and leading to outside the housing.

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**3,672,367**

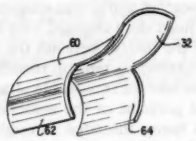
**RETAINING CLIP FOR CATHETER SHEATH**

**Henry M. Scislowicz, Lake Bluff, Ill., assignor to Abbott Laboratories, North Chicago, Ill.**

**Filed May 25, 1970, Ser. No. 40,010**

**Int. Cl. A61m *5/00***

**U.S. Cl. 128—214.4** **7 Claims**




Disclosed herein is a retaining clip for the sheath used to protect a catheter tube from contamination during insertion of the guiding needle. The clip is designed to snap over the hub of the needle and at the same time clasp the mouth of the sheath about the hub. The clip includes a curved body portion and a pair of curved depending legs. An upturned neck extends from the body portion to facilitate removal of the clip after the needle has been inserted.

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**3,672,368**

**SYRINGE**

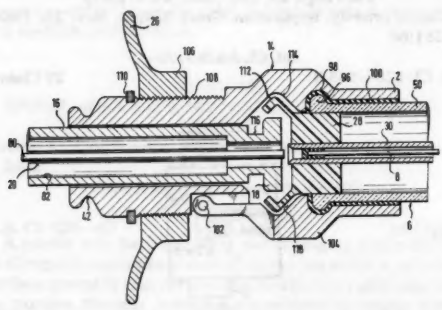
**Lothar Schwarz, 1 Belchenstrasse, Karlsruhe, Germany**

**Filed June 8, 1970, Ser. No. 44,216**

**Claims priority, application Germany, June 10, 1969, P 19 29 317.5**

**Int. Cl. A61m *5/00***

**U.S. Cl. 128—218 N** **11 Claims**




A hypodermic syringe comprising, a body assembly, a space being defined in said body, a preparation container receivable in said space, a tube extending through said preparation container, a hollow needle positioned within said tube, a seal on the end of said tube through which said needle is extrudable, an auxiliary plunger slidable within said body assembly and adapted to be moved into said tube to extrude said needle and an actuating plunger slidable within said body assembly and adapted to act on said container to expel said preparation through said extruded needle.

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**3,672,369**

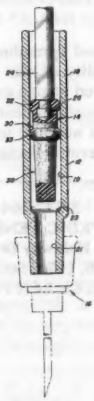
**HYPODERMIC SYRINGE**

**Alexander M. Brown, Daytona Beach, Fla., assignor to Sherwood Medical Industries, Inc.**

**Filed Dec. 18, 1969, Ser. No. 886,195**

**Int. Cl. A61m *35/00*, *5/22*, *5/32*; A61j *7/00***

**U.S. Cl. 128—218 P** **3 Claims**



A syringe of the hypodermic type including a unitary barrel member having a large upper bore and a small lumen at the lower end thereof communicating with the bore, the lower end of the barrel member being adapted to receive a needle, with a piston assembly slidable in the barrel member and having a sealing portion sealingly engaged the large bore and shaped to discharge all of the medicant from the large bore, there being provided a plunger fixed to the piston assembly and complementary to as well as coextensive in length with the barrel member lumen for the purpose of discharging all of the medicant from the lumen minimizing medicant loss in the syringe.

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**3,672,370**

**COLOSTOMY IRRIGATOR**

**Arthur E. Marsan, 6700 Escondido Drive, El Paso, Tex.**

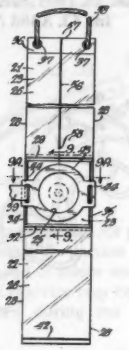
**Filed March 20, 1970, Ser. No. 21,287**

**Int. Cl. A61m *3/00***

**U.S. Cl. 128—227** **21 Claims**

This invention is characterized by the provision of an irrigator for colostomy and similar conditions, comprising a container for the irrigating liquid and a drain for the discharge from the patient, combined in an assembly including a short-length catheter for injecting the irrigating liquid, the assembly

comprising a single article of manufacture which functions in irrigating in all positions of the patient including upright ambulatory, the irrigator being designed for low cost of manufacture so that it is disposable after use.



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**3,672,371**

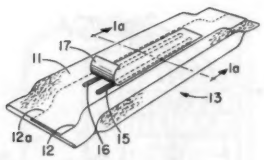
**SANITARY NAPKIN WITH IMPROVED ADHESIVE FASTENING MEANS**

**Robert J. Roeder, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.**

**Filed May 8, 1970, Ser. No. 35,753**

**Int. Cl. A61f *13/16***

**U.S. Cl. 128—290** **5 Claims**




A sanitary napkin provided with improved pressure sensitive adhesive means for attaching the napkin to a supporting garment. The adhesive is applied to the bottom surface of the napkin and comprises at least two narrow parallel lines covered by a single overlying protective release sheet. Each strip has substantially less width and total surface area when compared with the width and area of adhesive strips or patches formerly used for attachment purposes. A typical adhesive pattern applied to an 8 × 2¾ in. napkin comprises a pair of centrally disposed parallel strips, each strip being approximately 6 in. long and one-eighth in. wide, and spaced about three-eighth in. from each other. The two strip pattern uses less adhesive, yet is more effective in preventing displacement of the napkin and in counteracting the shear forces exerted on the napkin by normal leg motion. The arrangement prevents failure of the wrapper when the protective sheet is removed by the user. It also reduces considerably the incidence of adhesive transfer to the garment at the time when the napkin is removed from the garment for disposal.

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**3,672,372**

**URINARY DRAINAGE METHOD**

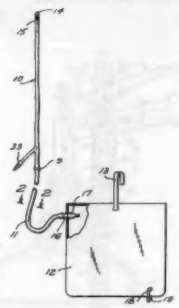
**Henry J. Heimlich, 3850 Clifton Avenue, Cincinnati, Ohio**

**Division of Ser. No. 776,591, Nov. 18, 1968, Pat. No. 3,605,749. This application May 11, 1971, Ser. No. 142,322**

**Int. Cl. A61m *25/00***

**U.S. Cl. 128—349 R** **7 Claims**

One end of a tubing, e.g., a catheter, is inserted into a patient's bladder, and the other end connected to a urine collection receptacle. At least a portion of the tubing has a degree of limpness such that it normally assumes a flat collapsed condition. As a result, a column of urine cannot remain in the tubing.



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**3,672,373**

**METHOD AND MEANS FOR REGULATING THE OPERATION OF APPARATUS FOR THE PRODUCTION AND PROCESSING OF CIGARETTES OR THE LIKE**

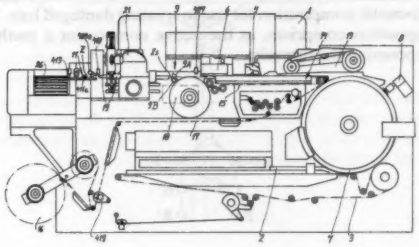
**Ernst Dogl; Albrecht Funck, both of Bayreuth; Dieter Wellach, and Hans-Georg Winkler, both of Hamburg, all of Germany, assignors to Hauni-Werke Korber & Co. KG, Hamburg-Bergedorf, Germany**

**Filed Jan. 5, 1970, Ser. No. 535**

**Claims priority, application Germany, Jan. 8, 1969, P 19 00 701.3**

**Int. Cl. A24c *05/34***

**U.S. Cl. 131—21 R** **25 Claims**

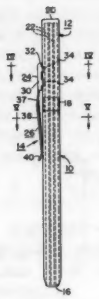


The operation of a production line including a cigarette making machine and a filter cigarette machine is regulated by a shift register which transports signals serving to initiate the starting and stoppage of various assemblies in the production line in a predetermined sequence. The shift register also serves to transport further signals produced by detectors which track filter cigarettes and their components. Such further signals are transmitted to an ejecting device which segregates those cigarettes which exhibit one or more defects or which are likely to exhibit defects because they are produced during certain stages of operation of the production line. The detectors scan the splices in a web of cigarette paper, the seam on the wrapper of a cigarette rod, plain cigarettes, filter rods, filter plugs and filter cigarettes.

## 3,672,374
## CADDY FOR HOLDING PIPE CLEANERS

Henry Mancuso, 430 Barclay Road, Rosemont, Pa.

Filed June 24, 1970, Ser. No. 49,278
Int. Cl. A24f 09/08
U.S. Cl. 131—243 4 Claims



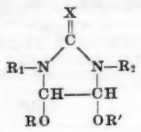
Two tubular members are separably joined together to serve respectively as the bottom and top sections of a caddy for holding several pipe cleaners. The top section is provided with a flat head for use in tamping tobacco into the bowl of a pipe, and with a resilient sheet metal appendage for use in scraping the bowl of, and for use in clipping the caddy to, a shirt or coat pocket.

## 3,672,375
## TREATMENT OF DAMAGED HAIR WITH METHYLOL COMPOUNDS

Gregoire Kalopissis; Henri Philippe De Beaulieu, both of Paris; Jean-Louis Abegg, Le Perreux, and Giuliana Ghilardi, Paris, all of France, assignors to Societe anonyme dite: L'Oreal, Paris, France

Filed Aug. 19, 1969, Ser. No. 851,473
Claims priority, application Luxembourg, Aug. 26, 1968, 56768
Int. Cl. A61k 7/06; A45d 7/04
U.S. Cl. 132—7 5 Claims

Cosmetic composition for use in treating damaged hair. The composition comprises, as the active component a methylol compound of the formula:



in a suitable cosmetic carrier, in which formula:

X represents either an oxygen atom or a sulfur atom or an NH group;

R and R′ are identical or different and represent either a hydrogen atom or a lower alkyl radical; and

$R_1$ and $R_2$ represent either a methyl hydroxy group or a methyl alkoxy group, e.g. methyl alkoxy wherein the alkoxy contains up to five carbon atoms or more.

Typically the methylol compound is

N,N′-dihydroxymethyl glyoxalurea or

N,N′-dihydroxymethyl glyoxalthiourea.

The composition is applied at an acid pH and is advantageously made up in solid form for mixing with water or water-and-alcohol solutions when used. The compositions are used by impregnating the hair with a mixture thereof and water or water-and-alcohol solution followed by drying with heat.

## 3,672,376
## HAIR SETTING ASSIST

Thomas J. Parlagreco, Ho-Ho-Kus, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

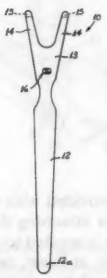
Filed Jan. 28, 1971, Ser. No. 110,702
Int. Cl. A45d 1/00
U.S. Cl. 132—9 4 Claims

A hair setting assist device comprises a removable rigid cap having spaced regions at which pivot pins are disposed for receiving forms for curls and other locations containing supports to which independent rollers can be secured.

## 3,672,377
## DENTAL CARE APPLIANCE

Paul G. Greenacre, 330 Driveway, Apt. 505, Ottawa, Ontario, Canada

Filed Jan. 5, 1971, Ser. No. 104,014
Int. Cl. A61c 15/00
U.S. Cl. 132—92 R 1 Claim



An elongated handle is provided at one end with a bifurcated head including a pair of spaced arms having notched extremities to receive a length of dental floss. A floss anchoring button is slidable in an opening in the head and has passages in which floss may be inserted and tensioned, so that when the button is slid in one direction in the opening, the floss is anchored in its tensioned condition. Auxiliary dental care attachments such as a brush, mirror, et cetera, are removably applicable to the outer end of the handle.

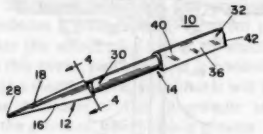
## 3,672,378
## TOOTHPICK DEVICE

Ralph H. Silverman, 7701 Arcadia, Morton Grove, Ill.

Filed May 5, 1971, Ser. No. 140,181
Int. Cl. A61c 15/00
U.S. Cl. 132—93 6 Claims

A molded plastic toothpick device includes a picking end having a triangular cross-section with two of the legs of the triangle being equal in length. The two walls of the picking end are concave and curved complementary to the shape of the teeth for easy insertion into the spaces therebetween. The picking end is tapered to a blunt free end. A handle formed in-

tegrally with the picking end includes a first cylindrical portion for rotating the device in the fingers to correctly insert the device in spaces between both the upper and lower teeth. An end portion of the handle has three flat walls and a curved wall to insure a stable grip on the device once the picking end has




been inserted between the teeth and for good maneuverability. The end surface of the handle portion is roughened to provide an abrasive for removal of minor stains from the surface of the teeth. The toothpick device may be impregnated with a pleasant tasting substance during the molding process if desired.

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**3,672,379**

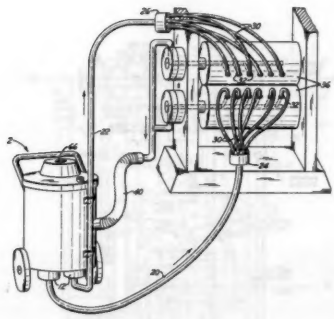
**VACUUM-SYSTEM CLEANING CIRCULATION DEVICE**

**Hans J. Seipel, 381 Matthews Road, Boardman, Ohio; Walter F. Gancarz, 731 W. Indianola Avenue, Youngstown, Ohio, and Donald J. Aves, 190 Hilltop Boulevard, Canfield, Ohio**

**Continuation-in-part of Ser. No. 832,718, June 12, 1969, abandoned. This application Feb. 14, 1971, Ser. No. 112,699**

**Int. Cl. B08b** *5/02, 9/00*

**U.S. Cl. 134—168 R** **6 Claims**



Equipment is disclosed that conveniently provides effective cleaning of envelope-folding, paper-converting or similar machinery containing perforated cylinders having a hollow interior and communicating with a vacuum system, for the manipulation or conveyance of one or more pieces of substantially imperforate sheet-like materials held against the exterior of the cylinders by ordinary atmospheric pressure. Equipment is provided comprising a reservoir chamber, pump means for forcing liquid from the chamber to a manifold, individual means communicating with the manifold for conveying liquid to the interior of the cylinders, and means connected with the vacuum system associated with the cylinders in the vicinity of the main pump, for returning liquid to the reservoir chamber, which is preferably evacuated. This yields effective cleaning of dirt, dust and lint not only from the perforations but also from valve faces, elbows, and other constrictions in the vacuum system.

**3,672,380**

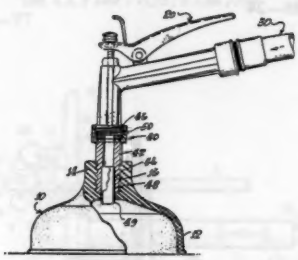
**CLEANING DEVICE**

**Frank Schuster, 16682 Juarez Drive, Rancho Bernardo, San Diego, Calif.**

**Filed Aug. 20, 1969, Ser. No. 851,698**

**Int. Cl. B08b** *3/02*

**U.S. Cl. 134—172** **2 Claims**



This is a device for cleaning by the use of water or other liquids in which the cleaning is accomplished by a jet of liquid properly contained to avoid splashing and to concentrate the cleaning effect, in which a rubber cup is used to confine and assist in cleaning.

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**3,672,381**

**COLLAPSIBLE UMBRELLA CAPABLE OF AUTOMATIC OPENING**

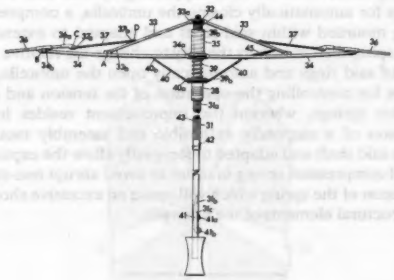
**Nobutoshi Kida, 1-27 Minami Nonincho, Osaka, and Kazo Saito, 9-374 Ohtori Naka-machi, Sakai, both of Japan**

**Filed July 23, 1970, Ser. No. 57,579**

**Claims priority, application Japan, Aug. 19, 1969, 44/65041; Nov. 14, 1969, 44/90147**

**Int. Cl. A45b** *25/14, 25/16*

**U.S. Cl. 135—22** **6 Claims**



This invention discloses a collapsible umbrella capable of automatic opening which comprises a center rod which is contractile and provided with an automatic umbrella opening mechanism; a rib assembly comprising a support rib, a receiving rib, an end rib and a connecting rib which are so assembled that they are adapted to form a quadrilateral in the open position of umbrella, said receiving rib being adapted to be held at substantially right angles with the center rod of the umbrella in said open position, one or more corners of said quadrilateral being made slidable and/or one or more sides of said quadrilateral being made contractile and extensible. Such an umbrella is capable of automatical and instantaneous opening by one-touch operation. In addition, such an umbrella is capable of presenting a good appearance in its open position and being collapsed neatly in its closed position.

## 3,672,382
## AUTOMATICALLY OPENABLE AND CLOSABLE UMBRELLA

Yoshio Sato, Nagareyama, Japan, assignor to Kabushiki Kaisha Ideal, Tokyo, Japan

Filed March 3, 1971, Ser. No. 120,427
Claims priority, application Japan, April 21, 1970, 45/34199
Int. Cl. A45b *25/14*
U.S. Cl. 135—24 3 Claims

An improvement of an automatically openable and closable umbrella of the type comprising a shaft composed of relatively telescoping shaft members, rings mounted on said shaft and carrying inner ends of ribs, supporting spokes and tension springs for automatically closing the umbrella, a compression spring mounted within said shaft and adapted to extend the telescoping shaft members thereby to change the relative positions of said rings and automatically open the umbrella, and latches for controlling the operation of the tension and compression springs, wherein the improvement resides in the provision of a steppedly extensible rod assembly mounted within said shaft and adapted to steppedly allow the expansion of said compression spring in order to avoid abrupt one-stroke expansion of the spring which will cause an excessive shock to the structural elements of the umbrella.

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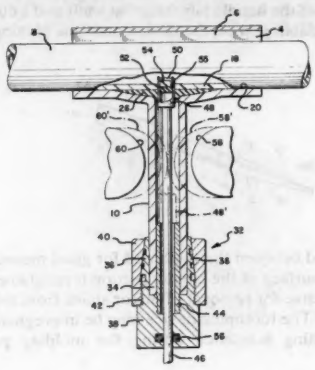
## 3,672,383
## METHOD AND APPARATUS FOR TAPPING PIPELINE

John Omer Trimble, Malvern, and Henry William Demler, Sr., Lebanon, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 25, 1970, Ser. No. 40,235
Int. Cl. F16e *41/04*; B23b *41/08*
U.S. Cl. 137—15 5 Claims

A generally T-shaped tap coupling is positioned in encircling relationship over a pipeline, and is heat shrunk thereover. The tap coupling includes a tap line portion receiving drilling apparatus therethrough which removes a coupon from the sidewall of the pipeline. The drilling apparatus with the coupon retained is partially withdrawn from the tap line portion. A clamping device collapses the sidewall of the tap line portion to prevent escape of conveyed material from the pipeline. The tap line portion is then permanently connected to a coupling of a tap line. The clamping device is removed



thereby permitting material from the pipeline to flow through the tap coupling into the tap line.

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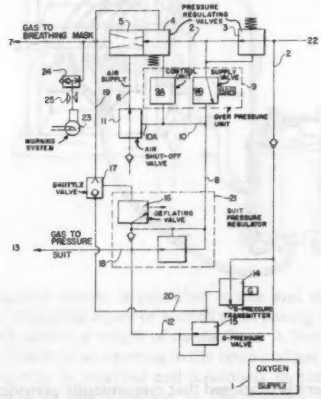
## 3,672,384
## BREATHING GAS REGULATOR FOR AVIATORS

Ivan A. Hellquist, Rotebro, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Sept. 15, 1970, Ser. No. 72,340
Claims priority, application Sweden, Sept. 18, 1969, 12810/69
Int. Cl. G05d *16/00*
U.S. Cl. 137—39 3 Claims




A breathing gas regulator for an aviator comprises an oxygen supply, a first pressure reducing valve, a second pressure reducing valve, and a branch line intermediate the two pressure reducing valves for conveying gas to pressurize the aviator suit in the event of cabin pressure failure. The second pressure reducing valve acts as a demand regulator supplying breathing gas at a normal breathing pressure of about 20 mm water column. The breathing gas outlet includes an air injector open to the cabin at cabin altitudes of up to 6 km for mixing air with the oxygen. The branch line includes a pressure responsive valve which shuts off the air supply at a cabin altitude of 6 km. Thus, the regulator supplies 100 percent oxygen at higher cabin altitudes. The branch line also includes a pressure-responsive control for increasing the breathing gas

pressure in the event of a loss of cabin pressure. In that event, the control unit increases the gas pressure supplied by the demand regulator an amount necessitated by the altitude. The branch line supplies gas to pressurize the suit and the amount of this pressure is conveniently set by controls as a function of breathing gas pressure. For example, suit pressure may be approximately 3.5 times breathing gas pressure. The device preferably includes a *g*-susceptible valve for pressurizing the suit to counter the effect of *g*-forces to which the aviator is subjected. In this event, suit pressure is controlled by suitable means, such as a shuttle valve, such that it will be a function of breathing gas pressure or the magnitude of a gas signal produced by the *g*-forces, whichever is greater.

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**3,672,385**

## CENTRIFUGAL SPEED GOVERNOR, ESPECIALLY FOR PRIME MOVERS

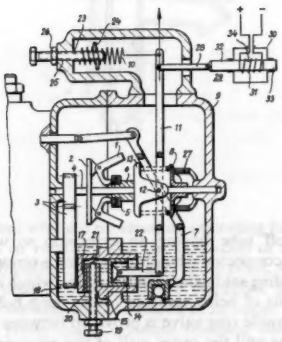
**Max Matzen, Leverkusen-Schlebusch, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne-Deutz, Germany**

**Filed April 13, 1970, Ser. No. 27,788**

**Claims priority, application Germany, April 11, 1969, P 19 18 411.3**

**Int. Cl. G05d *13/10***

**U.S. Cl. 137—53** **7 Claims**



A centrifugal speed governor in which the flyweights through the intervention of a spring-loaded adjusting sleeve and a linkage act upon a control member such as a fuel control member while in addition to the governor spring proper there is provided an additional spring associated with adjusting members having linked thereto lever means which, through a delaying member, is yieldably journalled in the housing of the governor, said lever means in addition to being adjustable by a spring operable from the outside of the governor is connected to holding means of magnetizable material, said holding means being axially movable in a magnetic field.

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**3,672,386**

## FUSE MELT TYPE DAMPER DEVICE FOR INTERCEPTING FLOW THROUGH A DUCT

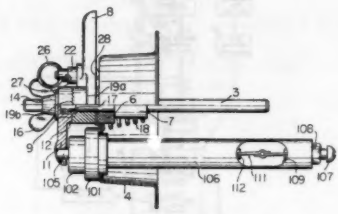
**Hisashi Mochida, Suita, Japan, assignor to Daito Mfg. Co. Ltd., Osaka, Japan**

**Filed June 2, 1970, Ser. No. 42,828**

**Claims priority, application Japan, June 6, 1969, 44/53069**

**Int. Cl. F16k *17/38*; F23n *3/04***

**U.S. Cl. 137—77** **8 Claims**



An improved fuse melt type damper device used for a damper and capable of effecting interception of a flow medium through a conduit upon instruction from a remote control center in addition to a function of an automatic interception of the flow through detection of overheating of the medium.

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**3,672,387**

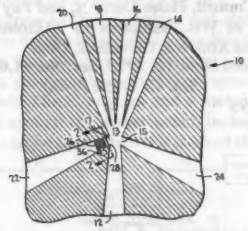
## MAGNETICALLY CONTROLLED PROPORTIONAL FLUID AMPLIFIER

**Fred T. Harris, Rockville, Md., and Edwin L. Resler, Jr., Ithaca, N.Y., assignors to The United States of America as represented by the Secretary of the Army**

**Filed Oct. 1, 1970, Ser. No. 77,166**

**Int. Cl. F15c *1/04, 1/14, 3/00***

**U.S. Cl. 137—81.5** **4 Claims**

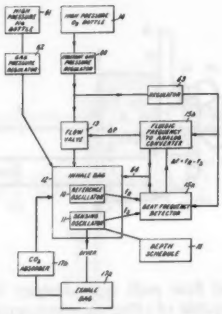


A proportional fluid amplifier that utilizes a magnetic fluid as control means for the proportional amplification therein. The magnetic fluid is placed in one of the two control ports of the amplifier and under the influence of an externally applied magnetic field is made to partially block the control port which, in turn, creates a low pressure region that causes switching of the power stream from one output channel to another. The magnitude of the externally applied magnetic field is proportional to the amount of blockage effected by the magnetic fluid in the control port, and thus to the magnitude of the low pressure region created therearound. In this way, the low pressure region can be controlled directly by external electrical apparatus and the power stream can be deflected to any one of a plurality of output channels as desired.

## 3,672,388
## SENSOR AND CONTROL SYSTEM FOR CONTROLLING GAS PARTIAL PRESSURE

Carl G. Ringwall, Scotia, and Rasik P. Shah, Schenectady, both of N.Y., assignors to General Electric Company

Filed June 19, 1969, Ser. No. 834,718
Int. Cl. G01n 9/24; G05d 11/16
U.S. Cl. 137—88 18 Claims

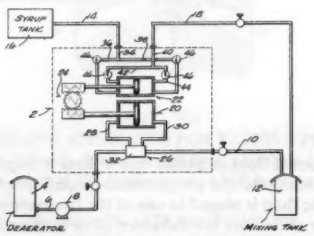


A sensor consisting of two electro-fluidic delay line oscillators generates a signal for controlling the partial pressure of a first gas in a multi-gas mixture. A sealed delay line of the first oscillator is filled with a known gas and functions as a reference oscillator. An apertured delay line of the second (sensing) oscillator is immersed in the gas mixture and the first gas flow thereto is controlled to obtain the sensing oscillator frequency equal to the reference frequency. Any difference frequency is proportional to the deviation of the actual first gas concentration from a predetermined value. A change in the partial pressure of the first gas, due to an environmental change, is compensated for by a predetermined change in the length of the sensing oscillator delay line and control of the first gas flow to regain the equal frequency condition.

## 3,672,389
## LIQUID PROPORTIONING DEVICE

Alexander McConnell, Hales Corners, and Fay D. Bickel, New Berlin, both of Wis., assignors to "Automatic" Sprinkler Corporation of America, Cleveland, Ohio

Filed Sept. 10, 1970, Ser. No. 71,071
Int. Cl. G05d 11/00
U.S. Cl. 137—99 11 Claims

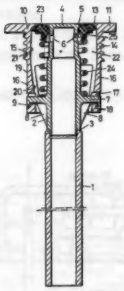



A device for substantially continuously mixing or blending two liquids in predetermined ratios to one another, comprising a first two-way acting piston-cylinder unit connected between a source of a first of the liquids under pressure and an outlet line to a mixing tank through a spool-type rotary reversing valve and reciprocable by the first liquid under the control of the reversing valve to deliver metered volumes of the first liquid to the mixing tank, a second two-way acting piston-cylinder unit connected between a source of the second of the liquids and another outlet line to the mixing tank through one-way flow valve controlled conduits and driven for reciprocating action by the first piston-cylinder unit to deliver metered volumes of the second liquid to the mixing tank through gear means which include a pair of paralleling, slidably mounted racks connected to the piston elements of corresponding of the piston-cylinder units and a rockable or rotatable ring gear mounted between and in meshing relation with the racks. The rock axis of the ring gear is defined by a precision bearing having a worm and screw adjustment and may be infinitely varied through such adjustment to regulate the "throw" of the ring gear towards the second piston-cylinder unit for purposes of obtaining a desired relationship in the operating strokes of the two units and a consequent desired ratio or proportion in the liquids being delivered thereby into the mixing tank.

## 3,672,390
## DRAW-OFF TUBE

Elbert Gravesteijn, Abcoude, Netherlands, assignor to Amstel Brouwerij N.V., Amsterdam, Netherlands

Filed July 14, 1970, Ser. No. 54,809
Claims priority, application Netherlands, July 16, 1969, 6910931
Int. Cl. B67d 5/54
U.S. Cl. 137—212 5 Claims



A draw-off tube having an extension to which there is detachably connected a head comprising a screwthreaded casing surrounding said extension coaxially, which screwthreaded casing admits of being screwed in the bung hole of a cask of beer. A movable ring valve is provided between the inner wall of the casing and the outer wall of the extension, which ring valve has its outer circumference adapted to simultaneously free or close a compressed gas passage and its inner circumference adapted to simultaneously free or close a beer passage formed by openings adjacent the closed end of the extension.

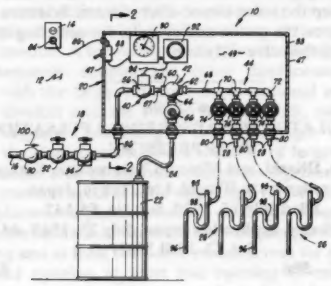
## 3,672,391
## AUTOMATIC CHEMICAL FEEDER APPARATUS

Richard W. Livingston, 10100 Raytown Road, Kansas City, Mo., and George L. Michaels, 8505 Booth Street, Kansas City, Mo.

Filed Jan. 2, 1970, Ser. No. 239
Int. Cl. B08b 9/06; F16k 19/00
U.S. Cl. 137—240 3 Claims

This invention is a chemical feeder apparatus operable to automatically discharge a chemical mixture into a plurality of sewer trap assemblies in order to remove any impurity such as grease build up. More particularly, this invention is a chemical feeder apparatus operable to receive an inlet fluid and mix the same thoroughly with a chemical solution through a concen-

trate valve structure for discharge therefrom through a plurality of outlet control valves for cleansing purposes and including



a timing mechanism for pre-selected periodic actuation thereof.

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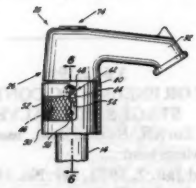
**3,672,392**
**YARD HYDRANT**

**Noel M. Anderson, P.O. Box 392, Storm Lake, Iowa**

**Continuation-in-part of Ser. No. 857,886, Sept. 15, 1969, abandoned. This application July 15, 1970, Ser. No. 55,109**
**Int. Cl. E03b** *9/08;* **F16k** *35/00*
**U.S. Cl. 137—288** **10 Claims**



A yard hydrant wherein no separate operating handle component is used or required and the operation of a valve assembly is accomplished by a movable spout head. A vertically disposed flow pipe disposed within a standpipe has a valve means at its lower end and is secured at its upper end to the hydrant head. Water under pressure reaching the valve will normally elevate the valve to closed position with the flow pipe and hydrant head being elevated accordingly. The valve means is either full open or full closed and is opened by depressing the hydrant head to correspondingly depress the flow pipe and open the valve. Means are provided to releasably lock the hydrant head and valve in depressed or full on position. Upon release of the head from depressed position, water pressure on the valve automatically elevates it to closed position. An adjustment means in the head relative to the top of the flow pipe is provided for regulating the volume of flow, if desired.

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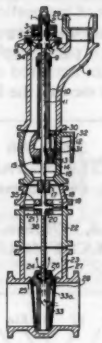
**3,672,393**
**HYDRANT VALVE ASSEMBLY**

**Hans Klassen, Zedernstr. 7, 4048 Grevenbroich, Germany**

**Filed Jan. 23, 1970, Ser. No. 5,434**
**Int. Cl. E03b** *9/08;* **F16k** *31/50, 37/00*
**U.S. Cl. 137—307** **3 Claims**

A gate valve, particularly the gate valve of a hydrant including a shut-off valve cooperating with the gate valve, is provided with a bleed passageway so that with the gate valve in the closed position, a small stream will flow from the upstream



side of the valve into the valve housing, indicating, when the housing is open, that the gate valve is closed.

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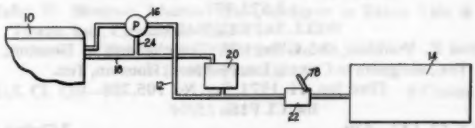
**3,672,394**
**FUEL SYSTEM FOR DIESEL ENGINES**

**Curtis L. Erwin, Jr., 5805 S.E. Gladstone Street, Portland, Oreg.**

**Filed May 22, 1970, Ser. No. 39,701**
**Int. Cl. F16k** *49/00*
**U.S. Cl. 137—338** **19 Claims**



The system of the invention is designed for treating liquid which may comprise as one instance means for cooling liquid. Such is accomplished by a novel cooling tank. The system has particular application in Diesel engines and also may be used as cooling systems for the liquid used in cooling machine tools. The system may include a meter arranged to measure consumption of fuel, particularly in the Diesel system. Where the system is used with Diesel engines and a meter is used, a by-pass is provided around the meter which includes a valve so that the by-pass can be used when it is desired that the flow be not measured.

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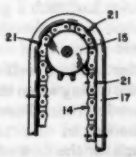
**3,672,395**
**CHAIN-HOSE ATTACHMENT CLIPS**

**William Fuetsch, 77 Corte Ramon, Greenbrae, Calif.**

**Filed Aug. 6, 1970, Ser. No. 61,667**
**Int. Cl. B65h** *75/36*
**U.S. Cl. 137—355.16** **4 Claims**



A flexible hose is attached at longitudinally spaced points to a link chain by a plurality of clips, so that the hose is carried by

the chain, as for example, around a sprocket. The hose is coplanar with the chain and located at the outside of the chain in relation to passage of the chain around the sprocket. Each clip is substantially U-shaped and includes a hose embracing bight portion with a pair of leg portions which are in supporting engagement with transversely spaced link members of the chain. The arrangement is particularly suitable for use on fork lift trucks having a chain actuated carriage with a hydraulically actuated device for moving the forks.

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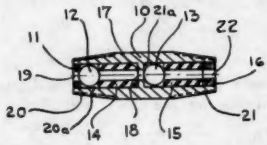
**3,672,396**
**METERING VALVE**
**Richard S. Pauliukonis, 6660 Greenbriar Drive, Cleveland, Ohio**
**Filed Dec. 2, 1970, Ser. No. 94,276**
**Int. Cl. F16k *15/18***
**U.S. Cl. 137—512** **7 Claims**




A valve for transmitting minute amounts of lubricant flow, be it grease or oil or other viscous fluid, from supply to receiver means, such as a bearing in a machine, having a short piece of elastomer tubing and a ball conveniently placed inside the valve body to perform the dual function of directional checking and volume metering without the use of springs.

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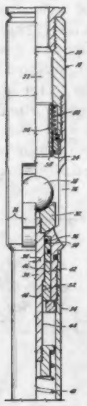
**3,672,397**
**WELL SAFETY VALVE**
**Fred E. Watkins, and Gilbert H. Tausch, both of Houston, Tex., assignors to Camco, Incorporated, Houston, Tex.**
**Filed Jan. 11, 1971, Ser. No. 105,226**
**Int. Cl. F16k *15/04***
**U.S. Cl. 137—529** **2 Claims**



A well safety valve for use in a well tubing for closing the flow of fluids through the tubing when the fluid pressure in the tubing decreases to a predetermined amount. A valve housing adapted to be positioned in the tubing and having a passageway therethrough for the flow of well fluid and a valve element below a valve seat with a piston positioned below and supporting the valve element. The piston being exposed to pressure in the passageway and extending into a closed cylinder which includes means acting in a direction to seat the valve element when the pressure in the tubing falls to a predetermined value. The cross-sectional area of the valve element being greater than the cross-sectional area of the piston to keep the valve closed after closure. Selective adjustment means on the piston and cylinder for selecting the pressure at which the valve will close.

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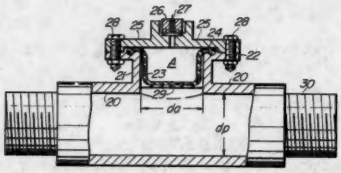
**3,672,398**
**ACCUMULATOR FOR ABSORBING A PULSATION OF PUMP PRESSURE**
**Ken Ichiryu, Hitachi, and Mitsuaki Takenoshita, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**
**Filed July 15, 1970, Ser. No. 55,147**
**Claims priority, application Japan, July 23, 1969, 44/57687**
**Int. Cl. F16l *55/04***
**U.S. Cl. 137—586** **5 Claims**




An accumulator to be provided in a conduit leading from a pump for absorbing a pulsation of pump pressure, which is so constructed that the ratio of the diameter of the accumulator neck da to the diameter of the conduit dp is not smaller than 0.5, i.e. $da/dp \geqq 0.5$ and the ratio of the length of the neck dL to the diameter of the conduit dp is not larger than 0.5, i.e. $dL/dp \leqq 0.5$.

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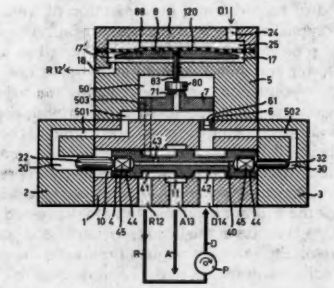
**3,672,399**
**HYDRAULIC OR PNEUMATIC CONTROLLED TWO STAGE SLIDE VALVE**
**Eduard Furrer, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland**
**Filed Jan. 7, 1971, Ser. No. 104,555**
**Int. Cl. F16k *11/07***
**U.S. Cl. 137—625.62** **4 Claims**




A fluid-operated, in particular hydraulically or pneumatically controllable, two-stage slide valve arrangement including an outlet stage arrangement for alternately communicating in flow relationship an outflow conduit with a pressure conduit and return flow conduit of a fluid-operated system is described and comprises a sleeve valve member having opposed end faces and respective coaxially extending displacement piston member acting upon each end face of said sleeve valve member, with the effective cross-sectional area of both said

displacement piston members differing from one another, the outlet stage arrangement alternately connecting said outflow conduit with said pressure conduit and said return flow conduit when the displacement piston member with the smaller effective cross-sectional area is continuously impinged by a predetermined pressure of a fluid medium delivered by said pressure conduit. A forwardly arranged control stage arrangement alternately couples the other displacement piston member with the larger effective cross-sectional area to the pressure conduit and the return flow conduit, said control stage arrangement including a first diaphragm means for coupling the displacement piston member of larger effective cross-sectional area of the outlet stage arrangement with the pressure conduit, and a second diaphragm means for coupling such displacement piston member of larger cross-sectional area with the return flow conduit. Both diaphragm means have an opening and at least one valve means serves for alternately closing and opening at least one opening of one of said diaphragm means, the valve means includes at least one to-and-fro movable valve body member cooperating with said one diaphragm means and a valve membrane for moving said valve body member. There is also means for selectively operating the valve membrane and thus said valve body member for closing and opening at least said one opening of said one diaphragm means.

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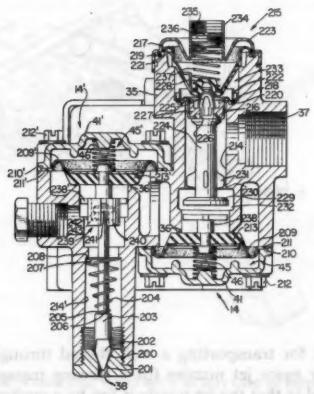
**3,672,400**

## PNEUMATICALLY OPERATED VALVE MEANS AND FUEL CONTROL SYSTEM UTILIZING THE SAME

**Douglas R. Scott, Elkhart, Ind., assignor to Robertshaw Controls Company, Richmond, Va.**

**Filed July 27, 1970, Ser. No. 58,284**
**Int. Cl. F16k *31/12***
**U.S. Cl. 137—630.22** **18 Claims**



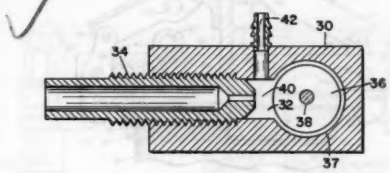
A pneumatically operated valve means having a housing means provided with an inlet separated from an outlet by a valve seat, the outlet having an orifice through which the entire fuel flow from the inlet must pass when the valve seat is open. A pneumatically operated valve member is carried by the housing for opening and closing the valve seat. A metering pin has one end cooperating with the orifice for controlling fuel flow therethrough and is operatively interconnected to the valve member to be moved thereby for providing different levels of fuel flow through the housing.

**3,672,401**

## FLUID FLOW RESTRICTOR HAVING A VARIABLE COEFFICIENT OF RESTRICTION

**Herbert M. Eckerlin, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.**

**Filed July 15, 1968, Ser. No. 744,945**
**Int. Cl. F15d *1/02***
**U.S. Cl. 138—43** **4 Claims**



A valve for controlling fluid pressure and volume of flow in fluid systems utilizing a nozzle which issues a stream of fluid into a housing against the surface of an adjustable die. The length of gap separating the nozzle and die can be changed to effect a change in the coefficient of restriction of the valve without producing a significant change in the functional relationship between fluid volume flow and pressure drop therein. A substantially square root functional relationship is maintained by the valve over a range of gap lengths up to about 10 percent of the nozzle diameter.

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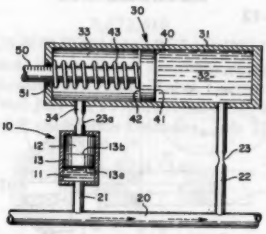
**3,672,402**

## AUTOMATIC PRECHARGE ADJUSTER

**John W. Bloemer, Mentor, Ohio, assignor to Eaton Yale & Towne, Inc., Cleveland, Ohio**

**Filed Sept. 14, 1970, Ser. No. 71,947**
**Int. Cl. F16l *55/04***
**U.S. Cl. 138—31** **8 Claims**

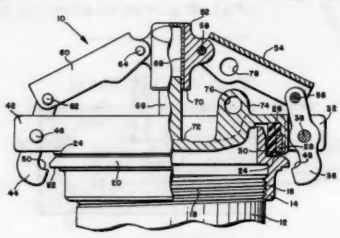


An automatic precharge gas pressure adjuster for a hydraulic desurger for automatically adjusting the precharge gas pressure in response to operating changes in system fluid pressure thereby maintaining a constant volume of precharge gas in the desurger. The adjusting unit comprises a cylinder divided into two chambers by a spring-biased differential-area piston. The system fluid pressure communicates with the chamber facing the first or largest area piston face while precharge gas communicates with the chamber facing the second or smallest area piston face. To assure the precharge gas pressure will be adjusted for changes in system operating pressure only, and not for mere surges, snubbing restrictions are placed in the means connecting the hydraulic system with the precharge gas adjusting unit.

## 3,672,403
## CAP AND SEALING MEANS THEREFOR

Fred A. Wilson, Florence, Ky., and Norman T. Allen, Cincinnati, Ohio, assignors to Dover Corporation, Cincinnati, Ohio

Filed July 27, 1970, Ser. No. 58,603
Int. Cl. F16l 55/10
U.S. Cl. 138—89 8 Claims

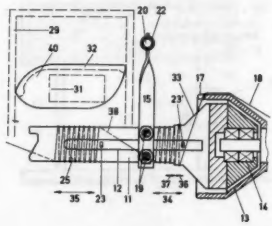


A cap and sealing means therefor for capping and sealing the end of a pipe is disclosed. The cap includes a pair of pivotally mounted locking arms for coengagement with an adaptor ring, the adaptor ring being mounted on the end of the cap to be sealed. The locking arms and adaptor ring have cooperative flat surfaces to insure a firm lock. A sealing ring is mounted in the cap for sealing engagement with the flat portion of the adaptor ring when the cap and adaptor ring are in locking engagement. Each locking arm is pivotally interconnected with a single movable element wherein movement of the single element permits engagement or disengagement of the locking arms with the adaptor ring.

## 3,672,404
## DEVICE FOR PRODUCING THREAD WINDINGS ON A LOOM

Edgar H. Strauss, Ruti, Zurich, Switzerland, assignor to Ruti Machinery Works Ltd. (formerly Caspar Honegger), Zurich, Switzerland

Filed Feb. 2, 1971, Ser. No. 111,932
Claims priority, application Switzerland, March 18, 1970, 4049/70
Int. Cl. D03d 47/26
U.S. Cl. 139—12 8 Claims

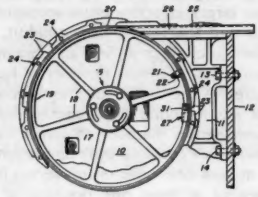


A device on a loom for the production of thread windings of predetermined length which comprises a winding element, a rotor means for winding a thread about the winding element, the winding element having a winding zone on which the thread is wound and a delivery zone from which the thread is delivered to a means, e.g. a shuttle, for inserting the thread into an open shed, and displacement means for periodically displacing a given number of turns of the thread wound on the winding zone as a thread winding to the delivery zone. The winding zone comprises a measuring portion for the thread to be wound on that has a cross-section of substantially constant circumference and a narrower portion that is adjacent to said measuring portion having a cross-section of smaller circumference.

## 3,672,405
## TAPE WHEEL FOR SHUTTLELESS LOOMS

Maurice R. Flamand, Cumberland, R.I., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed May 27, 1971, Ser. No. 147,364
Int. Cl. D03d 47/18
U.S. Cl. 139—122 R 4 Claims

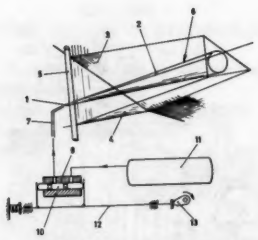


An improved tape wheel for shuttleless looms having an expansion joint formed in the rim thereof for the purpose of preventing expansion of said rim in a radial direction when subjected to the heat generated by a flexible tape which during the performance of its intended function is continuously being wrapped about and thence extended from said rim.

## 3,672,406
## METHOD FOR TRANSPORTING A WEFT THREAD THROUGH A SHED AND LOOM FOR PERFORMING SAID METHOD

Geert Jan Vermeulen, Beethovenlaan 34, Deurne, Netherlands

Filed Oct. 22, 1970, Ser. No. 83,175
Claims priority, application Netherlands, Oct. 22, 1969, 6915973
U.S. Cl. 139—127 P 3 Claims



A method for transporting a weft thread through a shed using one or more jet nozzles for a flowing transport fluid characterized in that the jet nozzle is fed by a cyclically varying quantity of transport fluid.

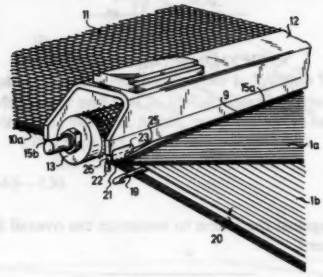
## 3,672,407
## TEMPLE FOR LOOMS

Paul Luber, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 4, 1970, Ser. No. 60,871
Claims priority, application Switzerland, Aug. 12, 1969, 12219/69
Int. Cl. D03j 1/22
U.S. Cl. 139—295 5 Claims

A temple for looms includes, mounted on the bar at which the newly woven cloth is deflected out of the weaving plane to pass over a stretching element, a finger-like guide member ad-

justable lengthwise of the temple in the plane of the cloth for control of the edge warps. The guide member is carried on a



support displaced perpendicularly out of the weaving plane to separate the edge warps from the weaving plane.

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**3,672,408**

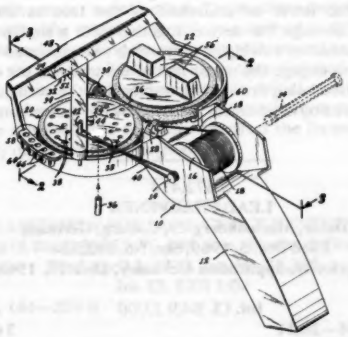
**WIRE BENDING DEVICE**

**Philip B. Dubrfuil, Redondo Beach; Stephen Bartok, Torrance, and William R. Crawford, Canoga Park, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.**

**Filed Nov. 12, 1970, Ser. No. 88,785**

**Int. Cl. B21f *1/00***

**U.S. Cl. 140—102** **5 Claims**



A device which can bend wire in any one of numerous regular patterns so that the wire can be dipped into a plastic solution to form simulated flowers, comprising a frame which can hold a spool of wire that is fed through guides that bend it in a selected pattern. The device includes a pair of wheels with contacting peripheries for feeding the wire into a pair of guides, one being a stationary guide and the other a movable guide that pivots in a regular pattern to determined the shape in which the wire will be formed. The movable guide is mounted at one end of a pivotally mounted arm whose other end is moved by a programmable cam arrangement. The programmable cam arrangement includes several holes formed in one of the wheels, pins which can be inserted into any of the holes, and a spring that urges the arm against the pins so that as the wheel rotates the pins pivot the lever to turn the movable guide.

**3,672,409**

**WIRE COILING APPARATUS**

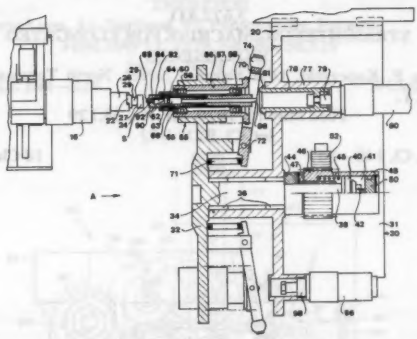
**Walter Angst, Kloten, Switzerland, assignor to Meteor AG, Glattbrugg, Switzerland**

**Filed April 15, 1969, Ser. No. 816,256**

**Claims priority, application Switzerland, April 19, 1968, 5847/68**

**Int. Cl. B21f *3/00***

**U.S. Cl. 140—92.2** **5 Claims**



There is disclosed a wire coiling or winding apparatus comprising a turret table means and a plurality of winding mandrels rotatably and drivingly mounted at said turret table means. A drive mechanism drivingly engages with one of said winding mandrels when the turret table means has assumed a predetermined position. A winding spindle is continuously coupled with the drive mechanism, said winding spindle having an axis piercingly extending through the pitch circle of said turret table means and parallel to the axis of rotation thereof. Means are provided for mounting said winding mandrels at said turret table means for axial displacement, and there are means for selectively engaging and disengaging from said winding spindle through axial displacement that winding mandrel momentarily located at said predetermined position of said turret table means.

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**3,672,410**

**APPARATUS FOR FORMING RETAINING MEMBERS**

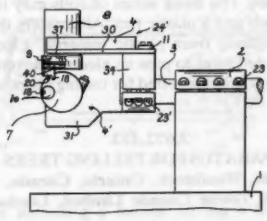
**Konrad Scheckel, Hagen-Kabel, Germany, assignor to Heetmann & Finkensiep KG, Hagen-Kabel, Germany**

**Filed July 22, 1970, Ser. No. 57,106**

**Claims priority, application Germany, July 23, 1969, P 19 37 340.1**

**Int. Cl. B21f *35/02***

**U.S. Cl. 140—103** **11 Claims**



Apparatus for forming retaining members on a helical spring having a helical coil section and two tangentially extending ends has a pair of motor-driven bending assemblies arranged facing each other. Each assembly has a pair of fluid motors, one of which bends one of the tangentially extending

ends of the spring into a direction which is parallel to the axis of the coil section and the other of which forms the retaining member on the bent spring end. Mounting means is arranged adjacent to and between the two bending assemblies and is arranged to releasably hold at least a portion of the helical coil section of the spring and is positioned to permit the spring ends to be bent and formed by the respective bending assemblies. The fluid motors, which may be either hydraulic or pneumatic, are adjustably mounted in respective clamping stands, and may be locked in a desired position.

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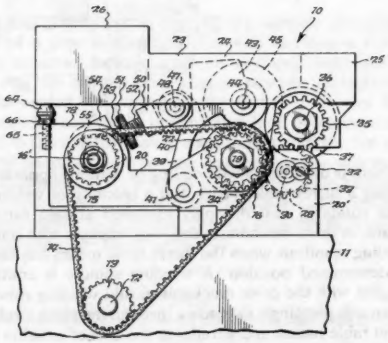
**3,672,411**
**STRAIGHTENING MACHINE FOR ELONGATED WORKPIECES**

**John F. Kopczyski, 1671 Sweeney Street, North Tonawanda N.Y.**

**Filed May 18, 1970, Ser. No. 38,129**
**Int. Cl. B21f 1/02**
**U.S. Cl. 140—147** **18 Claims**



A machine for straightening an elongated workpiece including a base, a first series of axially spaced rolls mounted on said base, a second series of axially spaced rolls mounted in contiguous relationship to the first series on a pivotable frame which is pivotally mounted on said base and which includes a counterweight for biasing the second series of rolls toward the first series of rolls, and a third series of axially spaced rolls mounted on a pivotable carrier for movement toward and away from the first and second series of rolls so as to permit a workpiece to be admitted between the three series of rolls when the third series is in an away position and to thereafter move into engagement with the workpiece so that it is rolled by the three series of rolls and thereafter pushed through the space between the first and second series as a result of the continued movement of the third series of rolls toward the first and second series. The three series of rolls may include rolls having a steel hub and a plastic rim. Alternately the rolls may be fabricated entirely from plastic material. Electric circuit means are provided so as to pass an electric current through a workpiece while it is being rolled for testing purposes.

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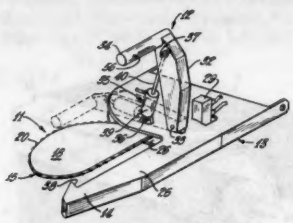
**3,672,412**
**APPARATUS FOR FELLING TREES**

**Alva Z. Albright, Woodstock, Ontario, Canada, assignor to Eaton Yale & Towne Canada Limited, London, Ontario, Canada**

**Filed Jan. 4, 1971, Ser. No. 103,482**
**Int. Cl. A01g 23/08; B27b 17/02; B27g 19/00**
**U.S. Cl. 143—32 N** **6 Claims**

A chain saw adapted to be mounted on a vehicle such as a skidder, and a pusher bar mounted on the chain saw frame and operable to apply a felling force against the tree as the saw cuts through it. The pusher bar includes a hollow support member which surrounds the pusher actuating mechanism to both protect the mechanism and permit the pusher bar to be



folded flat against the frame to minimize the overall height of the attachment.

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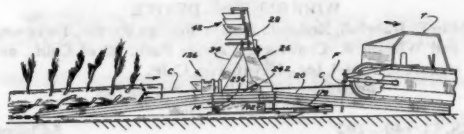
**3,672,413**
**DEVICE FOR DELIMBING TREES**

**Eino J. Jouppi, Isabella, Minn.**

**Continuation-in-part of Ser. No. 3,941, Jan. 19, 1970, abandoned. This application Nov. 23, 1970, Ser. No. 91,875**
**Int. Cl. A01g 23/02**
**U.S. Cl. 144—2 Z** **23 Claims**



A device for delimbing felled trees with which a tree is drawn through the device and a blade cradle for supporting the trunk of the tree and for cutting off the branches on substantially the lower or underhalf of the tree as the tree progresses through the device, together with a similar blade cradle mounted on a swinging arm which when lowered causes the blades to engage the upper half of the tree and cut off the limbs, the tree being drawn by a tractor and the swinging arm being lowered by mechanism actuated by the movement of the tree.

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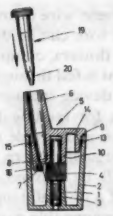
**3,672,414**
**LEAD SHARPENER**

**Gerald W. Dahle, Marienhberg 19, Coburg, Germany**

**Filed Dec. 5, 1969, Ser. No. 882,554**
**Claims priority, application Germany, Dec. 10, 1968, P 18 13 636.2**
**Int. Cl. B43l 23/00**
**U.S. Cl. 144—28.11** **3 Claims**



A lead sharpener which may be carried in the pocket of a coat and comprises a head with an inclined lead-holder channel which is partly inserted in and rotatable relative to a hous-

ing and about a fixed milling cutter in the housing so that the tip of the lead to be sharpened revolves about the cutter. The main weight of this head is located within the housing so as to attain a flywheel effect as closely as possible to the milling cutter when the head is turned to sharpen the tip of a lead.

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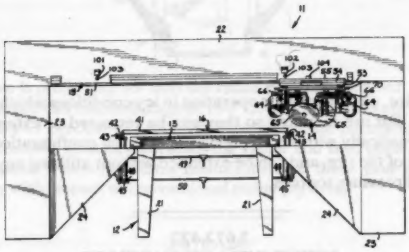
**3,672,415**

## WOODWORKING MACHINE

**Leif A. Holan, Winona, Minn., assignor to William Wernz; Rudolph Miesbauer and Leif A. Holan, Stockholders of Winona Industries, Inc., Winona, Minn., part interest to each**

**Filed Sept. 25, 1969, Ser. No. 861,001**
**Int. Cl. B27f 5/00; B27b 7/02**
**U.S. Cl. 144—136** **13 Claims**



A woodworking machine is disclosed that forms a plurality of properly oriented grooves in a wood panel to effect simple cabinet fabrication. The panel rests on a horizontal table having an alighment fence and a plurality of selective operable stops that enable placement of the panel on the table in a plurality of predetermined grooving positions. A clamping device holds the panel in one of the positions, and a groove is then formed by a cutting assembly including a pair of rotary cutters both of which are disposed at 45° with respect to the table and at 90° with respect to each other. The machine includes means for lowering the cutting assembly to a desired position above the table and advancing the assembly with respect to the panel to form the groove. The assembly is then elevated to a non-cutting position and returned to its initial position. The machine also includes means for automatically actuating the stops in a preselected sequence to effect the formation of a plurality of properly placed grooves.

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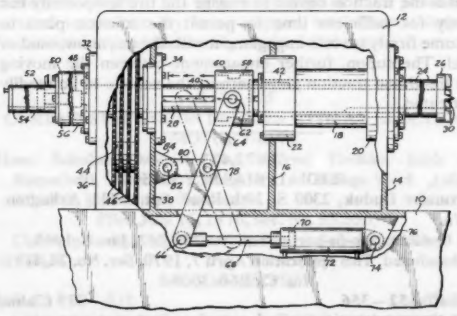
**3,672,416**

## DRIVE ASSEMBLY FOR DUAL CHUCK VENEER LATHES

**Gaylard O. Reed, 8636 S.W. 14th Ave., Portland, Oreg.**

**Filed April 3, 1970, Ser. No. 25,387**
**Int. Cl. B27l 5/02**
**U.S. Cl. 144—209 R** **5 Claims**



A veneer lathe frame supports a pair of axially aligned log-supporting chuck assemblies each including a pair of rotary chuck-supporting spindles arranged concentrically for independent longitudinal reciprocation. The inner spindle is connected to a rotary drive source and is coupled to the outer spindle for rotating the latter. The inner spindle is connected through a thrust bearing to an axially aligned hydraulic drive cylinder unit and the outer spindle is connected through a thrust bearing and floating drive link to a laterally positioned hydraulic drive cylinder unit.

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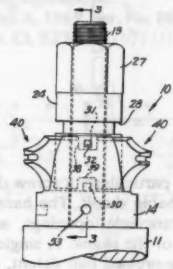
**3,672,417**

## COMBINATION SHAPER BLADE AND SUPPORT THEREFOR

**Roberto Lugo, Av. Nacional, 45, Panama City, Panama**

**Filed May 12, 1970, Ser. No. 36,529**
**Int. Cl. B27g 13/12**
**U.S. Cl. 144—218** **4 Claims**



A combination blade and support therefor in which the blade is eccentrically positioned with respect to the spindle and plane of the shaper blade extends at an oblique angle to the axis of rotation. The shaper blade is adjustable endwise with respect to its support to selectively present the cutting edges at each end to the work. The shaper blade cutting edges at each end of the blade may carry the same pattern or different patterns corresponding to the direction of rotation. The angular relationship of the plane of the blade to the axis of rotation reduces the shock load of the cut by having the blade enter the work gradually in a slice rather than abruptly as a chop. The support applies a firm, secure wedge-grip to the blade.

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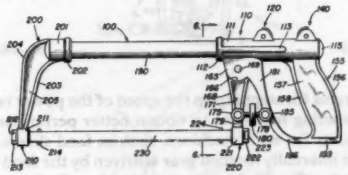
**3,672,418**

## ADJUSTABLE HANDSAW CONSTRUCTION

**Raymond C. Dreier, 3450 N. Lakeshore Drive, Chicago, Ill.**

**Filed Jan. 11, 1971, Ser. No. 105,539**
**Int. Cl. B27b 21/06**
**U.S. Cl. 145—34 R** **7 Claims**



A handsaw including a handle having a first telescoping member thereon, a beam having a second telescoping member on one end thereof cooperating with the first telescoping member, the handle and beam carrying means for holding a blade therebetween, and first and second longitudinally spaced apart stop members mounted on the handle in association with the first telescoping member for engaging the second telescoping member so that the handsaw may be quickly adjusted to accommodate two different lengths of saw blades by

engaging one of the first and second stop members with the second telescoping member. Means for orienting the first and second telescoping members are also provided.

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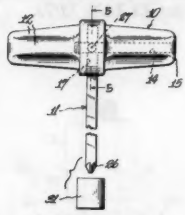
**3,672,419**
**HAND TOOLS**
**Alvin G. Fischer, 4516 E. Pleasant Valley Road, Independence, Ohio**
**Filed Oct. 6, 1970, Ser. No. 78,463**
**Int. Cl. B25g *3/06***
**U.S. Cl. 145—65** **6 Claims**



A hand tool, and particularly a screw driver, comprising a handle and a detachable shank. The handle has intersecting longitudinal and transverse openings, and either opening receives either end of the shank. A single holding means, in the form of a spring-pressed ball detent, is contained within the handle and is cooperable with the shank end to hold the shank assembled with the handle.

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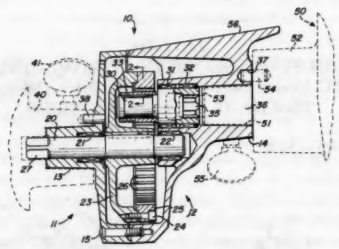
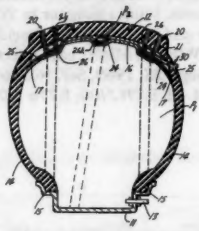
**3,672,420**
**SPEED INCREASING APPARATUS**
**Richard S. Hartley, and Franklin Douglas Houser, both of Troy, Ohio, assignors to The Hobart Manufacturing Company, Troy, Ohio**
**Filed May 25, 1970, Ser. No. 40,303**
**Int. Cl. B02c *18/00***
**U.S. Cl. 146—182** **8 Claims**



Apparatus for stepping up the speed of the power takeoff on food preparing machines to obtain better performance from attachments for such machines, such as food slicers. A large diameter internally toothed gear is driven by the food machine power takeoff and in turn drives a small diameter gear mounted on a shaft which provides a high speed power takeoff for the attachment. A protuberance is formed on the body of the speed increaser adjacent the point of connection of an attachment thereto which prevents the connection of a low speed attachment, such as a grinder, which could cause damage to the food preparing machine if inadvertently used in combination with the speed increaser. Additionally, the small diameter gear is friction mounted on the output shaft to prevent damage to the machine if excessive countertorque is applied to the attachment.

**3,672,421**
**SNOW TIRE WITH RETRACTABLE STUDS**
**James R. Anderson, Minneapolis, Minn., assignor to Research Incorporated, Minneapolis, Minn.**
**Filed May 15, 1970, Ser. No. 37,745**
**Int. Cl. B60c *11/16***
**U.S. Cl. 152—208** **4 Claims**



A tire, particularly for operation in icy conditions which has studs that are mounted so they can be retracted or extended pneumatically without changing the external configuration or shape of the tire, and can be extended without utilizing any external pressure sources.

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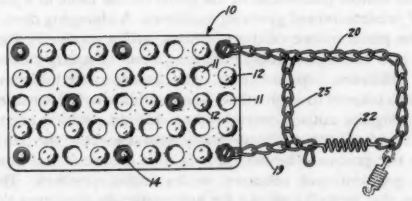
**3,672,422**
**VEHICLE TRACTION DEVICE**
**Frank J. Greipel, 49 E. Larpenteur, St. Paul, Minn.**
**Filed Oct. 9, 1970, Ser. No. 79,599**
**Int. Cl. B60c *27/00***
**U.S. Cl. 152—222** **5 Claims**



A traction device for use with automotive vehicles to assist in extrication of the vehicle from ice, snow, sand or mud, or the like. The traction device comprises a rigid or semi-rigid plate having an upper traction surface for engagement by the vehicle tire and having projecting members on the opposite surface adapted to bite or dig into the ice, snow, mud or sand in which the vehicle is stuck. Flexible means, such as chains, secured to the traction plate are provided for the purpose of firmly securing the traction mat to the vehicle tire at the interface with the material in which the vehicle is stuck. This causes the traction device to engage the tire temporarily but firmly for sufficient time to permit the traction plate to become firmly set into engagement with the ice, snow, mud or sand. Thereupon, further engagement between the moving tire tread and traction plate permits the vehicle to be readily extricated.

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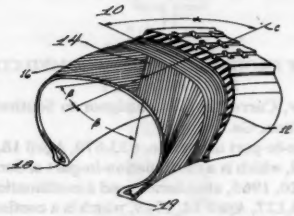
**3,672,423**
**RADIAL, BIAS PLY TIRE**
**Alexander Duduk, 2300 S. 24th Road Apt. #731, Arlington, Va.**
**Continuation-in-part of Ser. No. 789,242, Jan. 6, 1969, abandoned. This application April 7, 1970, Ser. No. 26,411**
**Int. Cl. B60c *9/06***
**U.S. Cl. 152—356** **19 Claims**

A tire construction is disclosed wherein there is a combination of radial and bias plies, there typically being twice as many bias plies as radial plies. In a preferred embodiment for

passenger car utilization, three plies are employed, a radial ply being disposed outside two bias plies. Both the bias and radial plies are preferably 12s × 12z twist for 1,260/2 and 840/3 denier cords and 10S × 10Z twist for 1,100/2 and 840/2 denier cords, while either of these twists may be employed with 1,100/3 denier cords. The angle of the bias ply in the cured



crown is preferably 35° and the radial ply preferably 90°. The preferred thermal shrinkage at 190° C. of both plies is approximately 17 percent (12 tpi). With these specific parameters, a cooperative structure between the radial and bias plies is effectuated which facilitates manufacture of these tires especially with respect to conventional radial ply tires.

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**3,672,424**

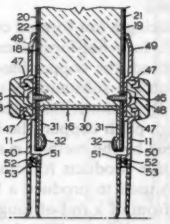
**MOVABLE PARTITION WALL**

**Mortimer Brown, Terra Cotta, Ontario, Canada, assignor to Ram Partitions Limited, Brampton, Ontario, Canada**

**Filed March 3, 1971, Ser. No. 120,398**

**Int. Cl. E06b 7/16**

**U.S. Cl. 160—40** **5 Claims**



In a movable partition wall consisting of a plurality of panels suspended from a ceiling track, the ceiling track is concealed by a box-like enclosure consisting of two complementary mouldings of vinyl plastic. The panels may be individual, or articulately connected in pairs or in concertina fashion. Each panel is formed with a kick plate which is combined with a flexible strip keyed to the kick plate to hide fastenings and to constitute a buffer. The edge mouldings of each panel are secured in position by being clipped into channel-shaped frame members and frictionally retained thereby.

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**3,672,425**

**CURTAIN SUSPENSION DEVICES WITH AN ELECTRIC MOTOR DRIVE**

**Hans Schulze-Robbecke, and Alfred Tiedtke, both of Remscheid, Germany, assignors to Riloga-Werk Julius Schmidt, Remscheid, Germany**

**Filed July 16, 1970, Ser. No. 55,353**

**Claims priority, application Germany, July 18, 1969, P 19 36 521.0**

**Int. Cl. A47h 5/032**

**U.S. Cl. 160—331** **16 Claims**

A curtain suspension device comprising an upper rail member and a lower rail member joined together and mounting a drive motor for drawing curtains supported by the device, the drive motor being mounted on one of the members

and the members being so shaped that they define a space to accommodate a drive pulley arrangement to act upon draw cords for the curtains.

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**3,672,426**

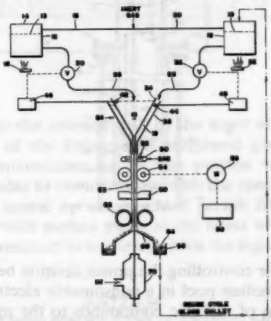
**PROCESS OF CASTING FILAMENT**

**Rodney H. Cornish, Chicago Heights; James T. Staulcup, and Richard M. Chaney, both of Chicago, all of Ill., assignors to Belden Corporation, Chicago, Ill.**

**Filed Oct. 8, 1969, Ser. No. 864,796**

**Int. Cl. B22d 11/10, 11/12**

**U.S. Cl. 164—5** **7 Claims**



A process and apparatus for producing metal filament directly from the molten state employing molten glass as a movable mold. The molten glass and metal flow in the same direction through a concentric housing and exit at the same velocity. The glass surrounds the metal and both materials solidify. The apparatus includes a stripping mechanism for removing the glass from the surface of the solidified metal.

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**3,672,427**

**METHOD OF LINING CONTOURED MOULDS AND HEAD BOXES WITH DEFORMABLE LINING ELEMENT**

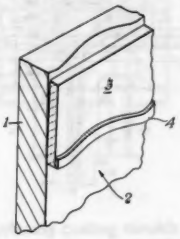
**Kenton Parkes Cooley, and Edward John Jago, both of Cleveland, Ohio, assignors to Foseco International Limited, Birmingham, England**

**Filed Jan. 4, 1971, Ser. No. 103,681**

**Claims priority, application Great Britain, Jan. 6, 1970, 638/70**

**Int. Cl. B22d 7/10**

**U.S. Cl. 164—6** **4 Claims**



Ingot mould heads and head boxes are lined with slabs or sleeves of deformable lining material. The lower edge only of

the slab or sleeve is deformed to fit tightly against the wall of the mould or head box and may be held in such deformed condition by means of a clip.

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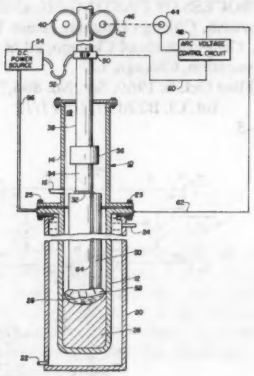
**3,672,428**

## POWER PARTITION CONTROL FOR CONSUMABLE ELECTRODE FURNACES

**Joseph W. Tommaney, Valencia, Pa., assignor to Allegheny Ludlum Steel Corporation, Brackenridge, Pa.**

**Filed Dec. 29, 1967, Ser. No. 694,657**
**Int. Cl. B22d *27/02***
**U.S. Cl. 164—52** **5 Claims**




System for controlling the power division between the electrode and molten pool in a consumable electrode furnace by the addition of metallic compounds to the melt for the purpose of stabilizing the arc and shifting the power partition and heat distribution between the electrode and molten pool, whereby the heat in the pool is reduced and that generated at the electrode to melt the same is increased.

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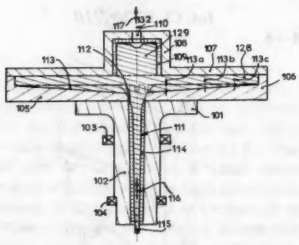
**3,672,429**

## METHOD FOR THE CENTRIFUGAL CASTING OF METAL IN A ROTATING HORIZONTAL SHELL

**Pierre Lajoye, 40 rue de la Vacquiniere, Montigny les Metz Moselle, France**

**Filed Sept. 15, 1969, Ser. No. 858,057**
**Claims priority, application France, Sept. 17, 1968, 6850397; Oct. 11, 1968, 6850493; Aug. 25, 1969, 6928972**
**Int. Cl. B22d *13/04***
**U.S. Cl. 164—63** **7 Claims**



A process for centrifugal casting of metal components in a mold revolving around a vertical axis by supplying liquid metal into a cavity in the mold and rotating the mold to cause the liquid metal to be transferred radially outwardly in the cavity by centrifugal force, while simultaneously applying a vacuum to the cavity for degassing the molten metal during casting thereof to prevent oxidation of the molten metal while it is being supplied into the cavity through radial channels formed in the bottom there.

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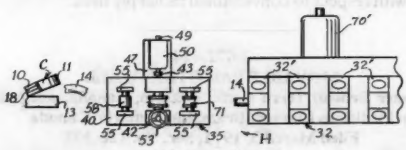
**3,672,430**

## METHOD OF PRODUCING A HOT-FORMED COPPER-BASE PRODUCT

**Daniel B. Cofer, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.**

**Continuation-in-part of Ser. No. 633,670, April 18, 1967, abandoned, which is a continuation-in-part of Ser. No. 498,773, Oct. 20, 1965, abandoned, and a continuation-in-part of Ser. No. 816,127, April 14, 1969, which is a continuation of Ser. No. 613,245, Feb. 1, 1967, abandoned, which is a division of Ser. No. 390,666, Aug. 19, 1964, Pat. No. 3,317,994. This application Feb. 2, 1970, Ser. No. 7,778**
**Int. Cl. B22d *11/06***
**U.S. Cl. 164—76** **13 Claims**



A method of producing a hot-formed copper-base product from a molten metal. In a hot-formed copper-base product produced by the method, the copper-base metal has copper oxide inclusions which are substantially uniformly dispersed and has a substantially uniform fine grain structure. In the form of a rod of tough pitch copper, the hot-formed copper-base product produced by the method is superior to prior art hot-formed copper-base products for drawing into wire and for other uses. When used to produce a hot-formed copper-base product in the from of a rod of tough pitch copper, the method includes substantially completely solidifying a molten copper-base metal to obtain a cast metal and hot-forming the cast metal into rod, the hot-forming being initiated while the cast metal is in substantially that condition in which it solidified and being of sufficient degree to substantially completely destroy the columnar dendritic structure of the cast metal.

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**3,672,431**

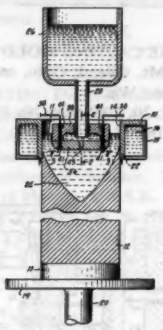
## APPARATUS AND PROCEDURES FOR CONTINUOUS CASTING OF METAL INGOTS

**Neil Burton Bryson, Kingston, Ontario, Canada, assignor to Alcan Research and Development Limited, Montreal, Quebec, Canada**

**Filed Sept. 25, 1970, Ser. No. 75,561**
**Int. Cl. B22d *11/10***
**U.S. Cl. 164—82** **5 Claims**

In continuous casting of aluminum ingots by delivering molten metal downwardly to an axially vertical mold while withdrawing cast ingot continuously from the lower end of the mold, the supplied molten metal impinges against a baffle positioned immediately beneath the metal delivering tube in the mold. The major flow of molten metal impinges against a baffle positioned immediately beneath the metal delivering tube in the mold. The major flow of molten aluminum is

directed laterally by the baffle, but a minor flow of the metal passes directly downward into the mold through a small central hole in the baffle, this hole being aligned with the mold axis.



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**3,672,432**

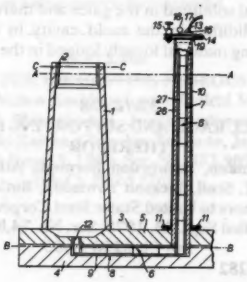
**BOTTOM POURED INGOTS**

**Roy Widdowson, Chesterfield, and Gene Donald Speceley, Penistone, near Sheffield, both of England, assignors to The British Iron & Steel Research Association, London, England**

**Filed Dec. 3, 1970, Ser. No. 94,689**

**Int. Cl. B22d *27/14***

**U.S. Cl. 164—119** **4 Claims**



In the known bottom poured method of casting steel ingots molten metal is poured down a runner system communicating with the bottom of the ingot mould. With the invention the runner system is made pressure tight and a pressurized gas is applied to the top of the upstanding runner of the runner system to displace some of the metal in the runner system into the mould. The mould may be of the bottle top type with a heat conducting plug for making a non-gas tight closure at the top of the mould, and pressurized gas may be applied so that metal in the mould contacts the plug.

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**3,672,433**

**PROCESS OF CASTING AN INGOT AND STRIPPING MOLD VERY SHORTLY THEREAFTER**

**Henri Jean Daussan, rue du Fort, Longeville les Metz Moselle, France**

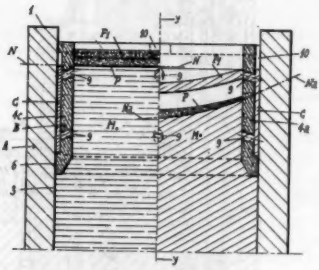
**Filed May 25, 1970, Ser. No. 40,187**

**Claims priority, application France, June 2, 1969, 6918293**

**Int. Cl. B22d *7/10, 29/00***

**U.S. Cl. 164—123** **3 Claims**

The disclosure relates to a process for the treatment of metal ingots in which ingot molds are intended to be stripped from ingots very shortly after filling and to a device for carrying out said process. A heat-insulating and/or exothermic lining is fixed prior to casting on the internal surface of the ingot mold in the vicinity of the upper portions thereof, in order that said lining should remain attached to the ingot at the time of stripping of the mold; the bottom portion of the lining is applied with zero clearance against the internal wall of the ingot mold along an impervious contact surface, whereas a narrow peripheral gap is formed above said mold impervious contact



surface between the internal wall of the ingot mold and the lateral surface of the lining; said peripheral gap is further adapted to communicate on its top portion with the atmosphere and also to communicate with the space inside the lining through lateral openings, which permit filling of said peripheral gap with molten metal at the latest when the cast metal bath has reached its top level within the ingot mold.

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**3,672,434**

**MACHINE FOR PRODUCING CASTING MOULDS**

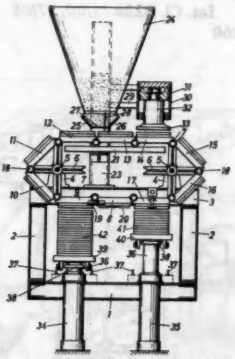
**Herbert Grolla, Laasphe, Germany, assignor to Heinrich Wagner Maschinenfabrik, Laasphe, Germany**

**Filed July 9, 1970, Ser. No. 53,347**

**Claims priority, application Germany, July 11, 1969, P 19 35 282.0**

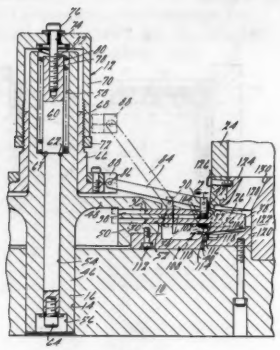
**Int. Cl. B22c *15/02, 25/00***

**U.S. Cl. 164—187** **6 Claims**



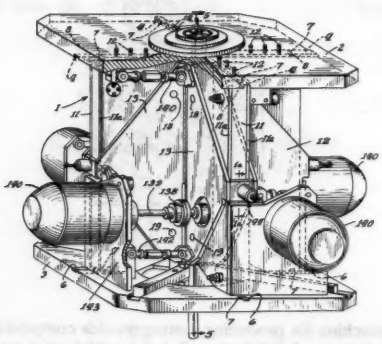
A machine for producing casting moulds comprises a multilink chain, each link being a flat plate which carries a moulding box. The chain is circulated to carry empty moulding boxes beneath a sand filling device followed by a compacting device and filled and patterned moulding boxes are ever tually removed from the chain and stacked on a lifting platform.

3,672,435
MOLD PATTERN
Ronald H. Buck, Jr., Farmington, and Ted Zbikowski, Southfield, both of Mich., assignors to Eaton Corporation
Filed March 23, 1970, Ser. No. 21,758
Int. Cl. B22c 7/00, 9/22
U.S. Cl. 164—247 10 Claims



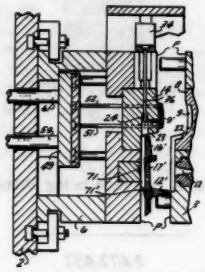
A permanent type non-expendable pattern for making refractory molds in which portions of the pattern are retractable from a projected position in which they are disposed in the cavity to be filled with the refractory molding material and a retracted position in clearance relationship relative to the refractory mold material, enabling an extraction of the pattern from the refractory mold produced. The retractable pattern sections, when in the projected position, are locked in accurate registration with the frame of the pattern, but upon initiation of retraction, are unlocked so as to enable pivoting movement of the sections, whereby they can be withdrawn from the mold cavities formed without damaging the mold surfaces.

3,672,436
VIBRATING WALL CONTINUOUS CASTING MOLD
James N. Wognum; Emil Simich, and Alvin L. Winkler, all of Chicago, Ill., assignors to Interlake Steel Corporation, Chicago, Ill.
Division of Ser. No. 643,562, June 5, 1967, Pat. No. 3,528,487.
This application Nov. 28, 1969, Ser. No. 877,542
Int. Cl. B22d 11/00, 27/08
U.S. Cl. 164—260 12 Claims



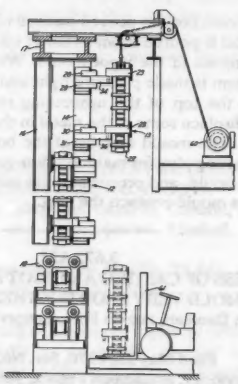
Apparatus for continuous casting of metal having a cavity formed by a plurality of flexible mold sections which minimize the problems of mold warpage by thermal expansion. Resilient backup for the mold sections for controlling mold cavity contour, improved mold section operating means and arrangement therefor is also provided.

3,672,437
DIE CASTING MOLD
Charles H. Bennett, Mt. Gilead, Ohio, assignor to Koehring Company, Milwaukee, Wis.
Filed Nov. 20, 1969, Ser. No. 878,464
Int. Cl. B22c 11/00
U.S. Cl. 164—265 10 Claims



A mold for producing decorative name plates or the like by die casting comprises a mold cavity in a fixed die part, gates for the mold cavity in a movable die part, internal runners within the movable die part feeding the gates, an external runner system on the fixed die part feeding the internal runners from a sprue cavity in the fixed die part, and a mechanism for breaking casting material solidified in the runners from casting material solidified in the gates and thereafter removing the casting solidified in the mold cavity in one piece with solidified casting material loosely lodged in the gates.

3,672,438
GUIDE-ROLL RACK AND SUPPORTING STRUCTURE THEREFOR
Gottfried Hofmann, Brentwood Borough, Allegheny County, and James T. Stull, Jackson Township, Butler County, both of Pa., assignors to United States Steel Corporation
Filed Sept. 23, 1970, Ser. No. 74,806
Int. Cl. B22d 11/00
U.S. Cl. 164—282 9 Claims



A guide roll rack and supporting structure for use in a continuous casting machine. The rack is formed in vertically aligned sections. The supporting structure includes pairs of

vertically spaced arms hinged to the support columns. The rack sections are removably carried on the arms, whereby the rack sections can swing with the arms from an operative position in the machine to a position outside the machine for easy removal and replacement.

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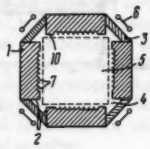
3,672,439

**MOULD FOR CASTING INGOTS OF RECTANGULAR CROSS SECTION IN THE METAL CONTINUOUS CASTING PROCESS**

Anatoly Ivanovich Manokhin, ulitsa Kandratjuka, 10, kv. 40, and Leonid Alexandrovich Sokolov, Baikalskaya ulitsa, 40/17, kv. 42, both of Moscow, U.S.S.R.

Filed Feb. 4, 1969, Ser. No. 796,329
Int. Cl. B22d *11/12, 27/04*
U.S. Cl. 164—283 3 Claims



A mold for casting ingots of rectangular cross section in a continuous metal casting process, which is provided with a means for controlling heat withdrawal from the surface of an ingot both in its corners and on its face thereby allowing a skin of a uniform thickness to be obtained along the entire perimeter of an ingot on its emergence from the mold, with the quality of the cast ingots being materially improved.

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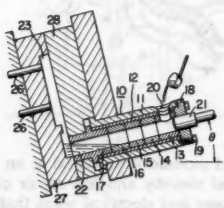
3,672,440

**APPARATUS FOR DIE CASTING FERROUS METALS**

Yasushi Miura; Nobuo Kashiwagi, and Zenichi Mochizuki, all of Numazu-shi, Shizuoka-ken, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Chuo-ku, Tokyo-to, Japan

Filed June 13, 1969, Ser. No. 832,989
Int. Cl. B22d *17/04*
U.S. Cl. 164—312 1 Claim



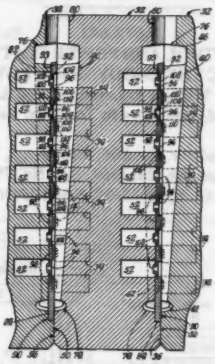
In a die casting machine for injection moulding metals of high melting points into a metal mold by means of an injection cylinder connected to the metal mold at one end and a plunger inserted into the injection cylinder from the opposite end, the injection cylinder comprises an outer cylindrical sleeve of high heat conductivity and is provided with a molten metal pouring opening near said opposite end and an inner cylindrical lining removably fitted in the outer sleeve, the inner lining including a plurality of sections of short axial length which are clamped together into the cylindrical lining, one of the sections positioned at the opposite end being provided with a molten metal pouring opening aligned with that of the outer sleeve.

3,672,441

**MOLD ASSEMBLY FOR VALVE LIFTERS**

Milton K. Wells, and Arthur S. Hedberg, both of Park Ridge, Ill., assignors to Wells Manufacturing Company, Skokie, Ill.

Filed Jan. 12, 1970, Ser. No. 2,071
Int. Cl. B22c *9/02, 9/20, 9/22*
U.S. Cl. 164—351 12 Claims



A mold assembly for valve lifters defined by a plurality of identical mold sections arranged in abutting relation. The front and rear faces of each mold section have a plurality of horizontal mold cavities arranged in vertical rows across their widths. Each face has a number of runner passageways which are in communication with the mold cavities in the abutting opposing face to provide a complete mold pattern formed at each parting line between abutting mold sections.

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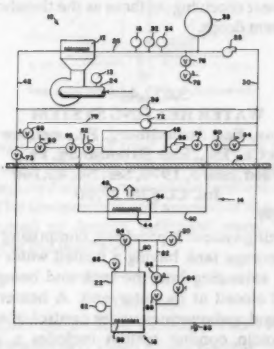
3,672,442

**MODULAR AIR CONDITIONING AND HEATING SYSTEM**

Kanwal N. Singh; Stephen P. Cremean, both of Columbus, and Donald R. Scott, Grove City, all of Ohio, assignors to Columbia Gas System Service Corporation, New York, N.Y.

Filed Oct. 5, 1970, Ser. No. 78,116
Int. Cl. F24f *3/00*
U.S. Cl. 165—22 15 Claims



An air conditioning and heating system for selectively heating or cooling a building while simultaneously heating the water supply for the building has a module adapted to be positioned outside the building, which module contains a boiler for supplying a heated heat transfer medium to first and

second heat transfer means within the building, and a water chiller for selectively supplying a chilled heat transfer medium to the first heat transfer means. The air conditioning system includes valve control mechanisms for selectively controlling the supply of heated and chilled transfer mediums to the first heat transfer means to selectively heat and cool air within the building, while the heated heat transfer medium supplied to the second heat transfer means warms the water supply for the building.

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**3,672,443**

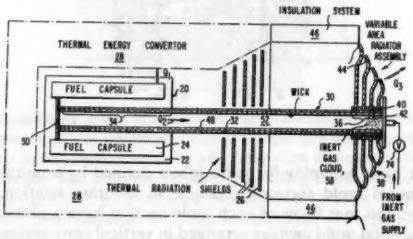
**THERMAL CONTROL AND POWER FLATTENING FOR RADIOISOTOPIC THERMODYNAMIC POWER SYSTEM**

**Walter B. Bienert; William J. Levedahl, and Alan J. Streb, all of Baltimore, Md., assignors to Teledyne, Inc., Los Angeles, Calif.**

**Continuation of Ser. No. 506,206, Nov. 3, 1965. This application Jan. 28, 1969, Ser. No. 797,368**

**Int. Cl. F28d** *15/00;* **G05d** *23/00*

**U.S. Cl. 165—32** **1 Claim**




A thermal control device utilizing the heat pipe principle. Heat receiving and heat rejecting surfaces are spaced from each other along the length of the heat pipe. In a preferred form, a radioisotope fuel capsule is in thermal conducting relationship with the heat receiving surface and a noncondensible gas is mixed with the working fluid of the heat pipe. A noncondensible gas automatically expands as the threshold temperature of the system drops to block off more of the heat rejecting surface. In other alternate preferred embodiments, a nonvaporizable liquid is utilized in lieu of a noncondensible gas to reduce the area of the heat receiving surface as the threshold temperature of the system drops or a second material is mixed with the working fluid which changes to a solid phase to block the flow of the working fluid between the heat rejecting and heat receiving surfaces as the threshold temperature of the system drops.

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**3,672,444**

**WATER HEATING SYSTEM**

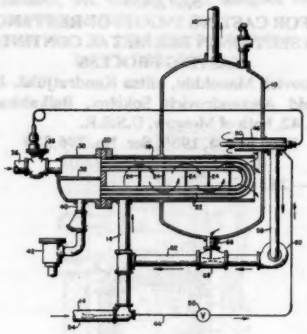
**Leonard F. Lowe, East Stroudsburg, Pa., assignor to The Patterson-Kelley Co., Inc., East Stroudsburg, Pa.**

**Filed June 3, 1970, Ser. No. 43,160**

**Int. Cl. F28f** *27/00*

**U.S. Cl. 165—39** **15 Claims**

A water heating system is provided, comprising in combination, a water storage tank having a heated water outlet and a heater shroud extending into the tank and being open at its inner end and closed at its outer end. A heater is disposed within the shroud and operates under control of a heat supply regulator. A main conduit system includes a continuously operating pump having its intake end in fluid communication with the interior of said tank at an upper level thereof and its discharge is arranged to deliver water into the outer closed end portion of the shroud. A feed water supply inlet is arranged in closed communication with said main conduit system; a water temperature sensor is disposed in the region of water withdrawal into said main conduit system, and, is operable to regulate the heat supply. A branch outlet conduit leads from the lower level of the tank into the main conduit line; and a feed water by-pass conduit is arranged to have its intake in communication with the feed water inlet and to deliver into said tank in close proximity to the temperature sensor. The



branch outlet and bypass conduit devices are provided with means whereby improved sensitivity and accuracy of control of the heat supply is acquired, in response to heated water withdrawals from the system.

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**3,672,445**

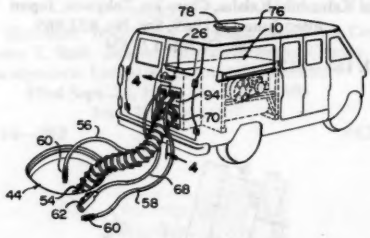
**UNDERGROUND SERVICE MODULE**

**Theo L. Carson, 1120 10th St., Denver, Colo.**

**Filed Aug. 31, 1970, Ser. No. 68,341**

**Int. Cl. B60h** *3/00*

**U.S. Cl. 165—42** **18 Claims**

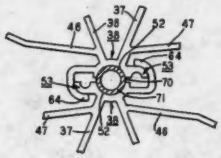



A self-contained module is mounted in an electrified van truck and powered thereby and has an air conveying tube, compressed air hoses and electrical wires that are extensible therefrom through a modified panel section of the truck so as to supply conditioned air, operating compressed air and electrical outlets to workmen in a manhole or other underground working area. Air is passed vertically through the module from the vented top of the truck over a heat exchanger or refrigeration coil and conveyed to the workmen through the extensible tube which is locked in a collapsed position within the module for storage and transportation. An air compressor supplies a volume of compressed air which air is directed to a receiver from which low pressure dry air and high pressure air, selectively admixed with a lubricator, are regulatingly passed through the air hoses that are mounted on automatic recoil reels in the module and have outer ends carrying air chucks with a remote control switch for the compressor being provided.

## 3,672,446
## AMBIENT AIR VAPORIZER

Alan R. Tibbetts, Costa Mesa, and Donald R. Tucker, Lakewood, both of Calif., assignors to Airco, Inc.

Filed Jan. 21, 1969, Ser. No. 792,593
Int. Cl. F28b *1/14*
U.S. Cl. 165—183 11 Claims

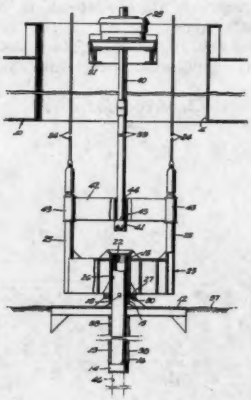


This invention relates to a finned assembly for a heat exchanger comprising an extended surface portion, an elongated tubular member, said extended surface portion comprising two identical parts, each having an internal cylindrical surface adapted to engage said tubular member and each having radially extending locking members adapted to engage locking members on the other of said parts. The invention further relates to methods and apparatus for attaching said extended surface portion to said member.

## 3,672,447
## MARINE WELL DRILLING METHOD AND APPARATUS

David C. Kofahl, Bakersfield, Calif., assignor to Richfield Oil Corporation, Los Angeles, Calif.

Continuation of Ser. No. 628,727, Dec. 17, 1956, abandoned. This application Sept. 10, 1968, Ser. No. 772,888
Int. Cl. E21b *7/12, 43/01*
U.S. Cl. 166—.6 8 Claims

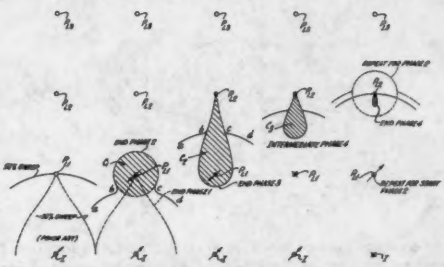


Method and apparatus for drilling an underwater well using subsurface wellhead equipment. A landing base is lowered at the lower end of a conductor pipe toward an underwater bottom. A guide frame is positioned above the landing base. A rotary driven tubular member, passed through the guide base is connected to the conductor pipe to drill the conductor pipe into the underwater bottom after the landing base rests on the bottom. The tubular member is removed after the conductor pipe is cemented and a bit is guided into the conductor pipe to drill hole for a surface casing having a mandrel at its upper end to which blowout preventers may be connected by a hydraulically actuated connector.

## 3,672,448
## INTERFACE ADVANCE CONTROL IN SECONDARY RECOVERY PROGRAM BY RESHAPING OF THE INTERFACE BETWEEN DRIVING AND DRIVEN FLUIDS AND BY THE USE OF A DYNAMIC GRADIENT BARRIER

Donald L. Hoyt, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. Nos. 786,565, Dec. 24, 1968, Pat. No. 3,592,265, and Ser. No. 786,568, Dec. 24, 1968, Pat. No. 3,593,787. This application Dec. 30, 1970, Ser. No. 102,815
Int. Cl. E21b *43/16*
U.S. Cl. 166—245 16 Claims

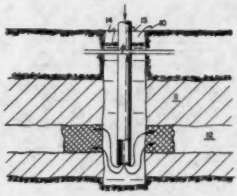


The interface between driving and driven fluids in a secondary recovery operation is reshaped after a cusp has developed by injection of a fluid via wells controlling the flow gradients, and the arrival of the injected driving fluid into the vicinity of a production well is delayed by the imposition of a dynamic gradient barrier of produced formation fluids.

## 3,672,449
## SELECTIVELY REDUCING THE PERMEABILITY OF A THIEF ZONE BY ELECTROLESS METAL PLATING

Edwin A. Richardson, and Russell C. Ueber, both of Houston, Tex., assignors to Shell Oil Company, New York, N.Y.

Continuation-in-part of Ser. No. 817,722, April 21, 1969, abandoned. This application Dec. 16, 1970, Ser. No. 98,872
Int. Cl. E21b *33/13*
U.S. Cl. 166—292 5 Claims



In selectively plugging a thief zone within a reservoir interval, solutions for activating and effecting an electroless metal plating are injected so that most of the injected fluid enters the thief zone. The composition and amount of the plating materials are adjusted to deposit sufficient metal to reduce the permeability of the thief zone.

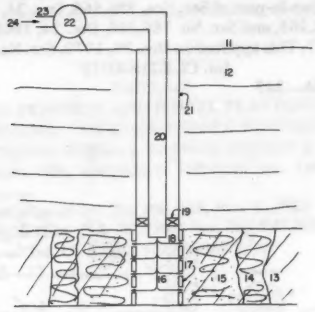
## 3,672,450
## METHOD FOR IN SITU COMBUSTION IGNITION

Pratip Bandyopadhyay, Tulsa, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed Jan. 28, 1971, Ser. No. 110,492
Int. Cl. E21b *43/24*
U.S. Cl. 166—260 8 Claims

A slug of material comprising an emulsion of water and carbon black with or without additives is injected into the vicinity about a proposed oxidant injection well in a fireflood pattern.

A downhole heater or other suitable ignition means is introduced into the vicinity of the wellbore to be ignited. The initiation of a combustion drive or fireflood is enhanced by the



presence of the carbon black material. Through injection of an oxidant, the carbon black ignites, forming an intense heat source about the wellbore from which the formation hydrocarbons are rapidly ignited.

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**3,672,451**

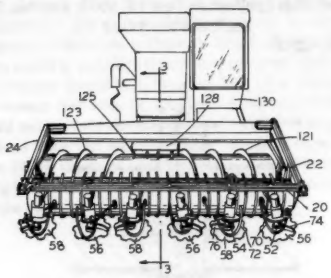
**BEAN HARVESTER**

**Addison C. Sheckler, Bonta Bridge Road R.D. #1, Cato, N.Y.**

**Filed May 22, 1970, Ser. No. 39,841**

**Int. Cl. A01d *25/04***

**U.S. Cl. 171—58** **3 Claims**



Harvester for beans and the like having a mobile support for parallel rows of bean plants, a pair of convex laterally disposed disks rotatably mounted on the support having peripheral notches, and being spaced apart and spaced to correspond substantially to the spacing of adjacent plant rows, and having their axes tilted transversely and rearwardly and having their convex faces adjacent their peripheries adapted to ride on the ground inwardly and forwardly of the disk centers, means for rotating the disks so their adjacent peripheries move rearwardly at the approximate forward speed of the support, stripper means overlying the adjacent areas of each disk adapted to move the plants of two rows into a common windrow between the disks, stripper plates disposed over the concave sides of each of the disks in an area opposite to the stripper bar areas, and a floating spring counterbalance support connected to the mobile support employing parallelogram linkages.

**3,672,452**

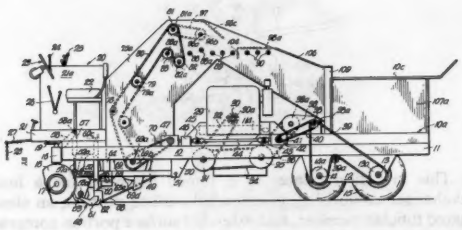
**APPARATUS FOR HARVESTING SOD**

**William W. Miner, P.O. Box 392, Cranbury, N.J.**

**Division of Ser. No. 618,765, Feb. 27, 1967, Pat. No. 3,519,082. This application Dec. 30, 1969, Ser. No. 889,034**

**Int. Cl. A01b *45/04***

**U.S. Cl. 172—19** **16 Claims**



An ambulatory apparatus cuts sod from a sod field in a continuous strip and includes a reciprocating cutting head assembly mounted substantially at the forward end of the apparatus. A conveying means conveys the strip cut by the cutting head assembly interiorly of and to the rear of the apparatus and into contact with a flail which strikes off excess attached soil from the underside of the soil strip. A severing apparatus cuts the sod strip into sod pads of a preselected size and a folding device folds the severed sod pads prior to same being placed on a pallet supporting area located at the rear of the apparatus.

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**3,672,453**

**MACHINE FOR DIGGING SOIL**

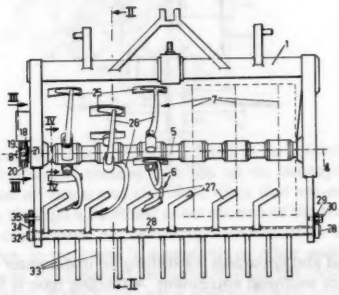
**Herbert Vissers, Nieuw-Vennep, Netherlands, assignor to Landbouwerktuigen-en Machinefabriek H. Vissers W.V., Rotterdam, Netherlands**

**Filed Feb. 10, 1970, Ser. No. 9,688**

**Claims priority, application Netherlands, Feb. 13, 1969, 6902245**

**Int. Cl. A01b *33/02, 33/10***

**U.S. Cl. 172—39** **2 Claims**



A machine for digging soil is provided, comprising a rotor, spades mounted tiltably on said rotor and retaining members which prevent dug-up clods of being moved further around with said spades instead of being moved to the ground.

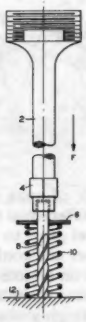
For preventing damage of machine parts the spades and retaining members are so shaped that in every tilted position of said spades they can pass between said retaining members which are disposed adjacent one another.

3,672,454

## SONIC TOOL APPARATUS

Keith L. Likins, Columbus, Ohio, assignor to The Ohio State University, Columbus, Ohio

Filed June 13, 1969, Ser. No. 833,131
Int. Cl. B06b *1/02*
U.S. Cl. 175—56 7 Claims



A means for improving the drilling rate of sonic and ultrasonic drills. Specifically, a sonic transducer, a tool, and a mechanical spring are used in combination to increase the amplitude of gross motion of the tool to better remove the particles and dust taken from the work surface. Reference is made to the claims for a legal definition of the invention.

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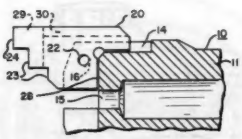
3,672,455

## DRAG BITS

James L. Foster, Jr., Ligonier Township, Westmoreland County, Pa., assignor to Tarton Industries, Inc.

Filed April 14, 1970, Ser. No. 28,417
Int. Cl. E21c *13/00*
U.S. Cl. 175—412 6 Claims



An earth drilling bit of the drag type is provided having a body with a plurality of radial slots at one end, each having a portion extending across said one end from the axis, a plurality of L-shaped wings removably fitted in said slots and held in place by resilient means extending through passages in the body and wings.

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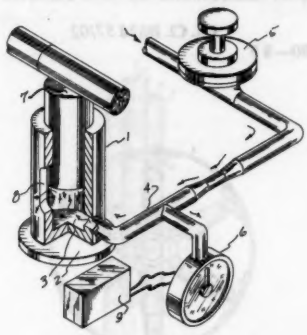
3,672,456

## DEVICES FOR WEIGHING SMALL OBJECTS

Benny Lee Hester, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed June 24, 1971, Ser. No. 156,176
Int. Cl. G01g *5/04*
U.S. Cl. 177—201 4 Claims

Device for rapidly weighing small, light weight objects comprising a vertical annular member having a duct open at its upper end and having a movable cylindrical member located therein. Air supply means are provided for feeding air to the bottom of the chamber to raise the cylindrical member. An escape slot is positioned in the wall of the chamber to allow for the escape of air therethrough when the bottom of the cylindrical member rises above the lowermost portion of the slot. Means are connected to the air supply means (e.g., a gauge) for determining the difference in pressure therein when an object to be weighed is placed on top of the cylindrical member



and depresses the same to reduce the effective area of the slot. The device is especially suitable for weighing very light objects, such as cigarettes.

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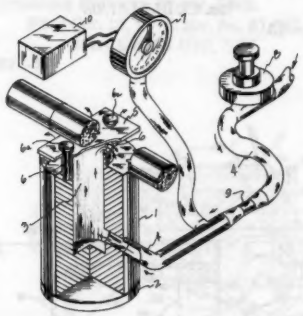
3,672,457

## DEVICES FOR WEIGHING SMALL OBJECTS

Benny Lee Hester, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed June 24, 1971, Ser. No. 156,177
Int. Cl. G01g *5/04*
U.S. Cl. 177—201 5 Claims



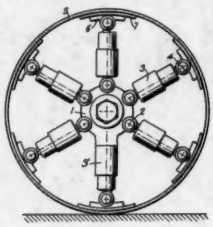
Device for rapidly determining the weight of light weight objects comprising a tubular member having a vertical duct therethrough for the passage of air. The duct is open at the top of the member and connected to means for supplying air for passage through the duct and out through the top of said member. Connected to the top of the member is a platform restricted in its lateral movement and adapted to be moved vertically to a predetermined point above said member to allow air from the duct in said member to exit beneath the platform, which platform is thereby suspended by the pressure of the exiting air. A calibrated pressure gauge is associated with the air supply means which registers the difference in pressure in the air supply means when an object to be weighed is placed on the platform and depresses the platform. The weighing device is particularly suited for rapid quality control procedures in the manufacture of light weight objects, such as cigarettes.

3,672,458

## DRIVER WHEEL OF VEHICLE

Julius Mackerle, Prague, Czechoslovakia, assignor to Ustav pro vyzkum motorovych vozidel, Prague, Czechoslovakia

Filed Feb. 16, 1970, Ser. No. 11,411
Claims priority, application Czechoslovakia, Feb. 17, 1969, 1058/69
Int. Cl. B62d 57/02
U.S. Cl. 180—8 F 7 Claims



A self-propelled driver wheel for a vehicle comprising a plurality of linearly expandable spokes uniformly arranged about a central hub, each spoke being separately joined to a supply of fluid under pressure and being provided with distributor means for selectively distributing the fluid to the spokes whereby on expansion thereof the wheel is caused to turn.

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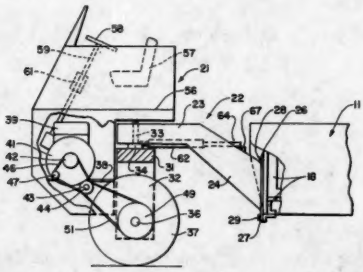
3,672,459

## SINGLE WHEEL, SELF-PROPELLING ATTACHMENT

Everett V. Rankins, 329 Flores Court, Manteca, Calif.

Filed July 1, 1970, Ser. No. 51,597
Int. Cl. B62d 61/08
U.S. Cl. 180—13 4 Claims



For attachment to farm implements of the type of balers, rakes, spraying equipment and the like, a wide single wheel is mounted on an axle rotatable within an inverted U-frame. A tongue is connected to the center of the U-frame about a vertical pivot, the rear end of the tongue being bolted to the implement. A prime mover for the axle is mounted on the U-frame, as is a cab for the operator and controls.

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## ERRATUM

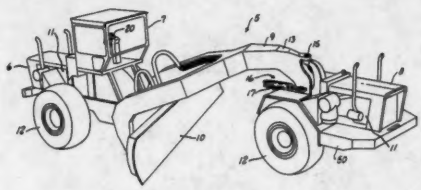
For Class 180—67 see:
Patent No. 3,672,048

3,672,460

## CONTROL MEANS FOR POWER STEERING SERVO

Harry H. Takata, Golden Valley, Minn., assignor to Raygo, Inc., Minneapolis, Minn.

Filed Feb. 16, 1971, Ser. No. 115,642
Int. Cl. B62d 5/06
U.S. Cl. 180—79.2 B 5 Claims



A vehicle having a pair of units relatively swingable by a steering servo features a differential device comprising a housing that confines two bevel gears to coaxial rotation independently of it and one another and confines a bevel pinion meshing with them to rotation on an axis transverse to theirs. The servo energization control is mounted on one unit, the other unit is connected on its swinging axis with one bevel gear. The other bevel gear is connected with the movable member of the energization control. The housing is connected with a steering wheel to rotate with its turning.

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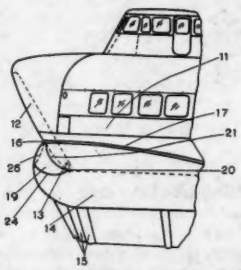
3,672,461

## FLEXIBLE SKIRT ASSEMBLIES FOR AIR CUSHION VEHICLES

Lavis Albert Henry Riddle, and Thomas Craig, both of East Cowes, Isle of Wight, England, assignors to British Hovercraft Corporation Limited, Yeovil, Somerset, England

Filed Oct. 8, 1969, Ser. No. 864,693
Claims priority, application Great Britain, Nov. 22, 1968, 55,453/68
Int. Cl. B60v 1/16
U.S. Cl. 180—127 11 Claims



An air cushion vehicle having flexible skirts, the vehicle being provided with a cabin having a pivotally mounted access door arranged to act as a loading ramp, wherein a portion of the flexible skirt is attached to and passes over part of the access door.

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3,672,462

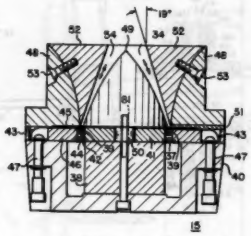
## APPARATUS FOR CONTROLLING SONIC ENERGY DISTRIBUTION

John H. Auer, Jr., Fairport, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Oct. 20, 1969, Ser. No. 867,621
Int. Cl. G01s 9/00; H04r 1/28
U.S. Cl. 181—.5 R 17 Claims

An electromechanical transducer is provided for producing pulses of sonic energy and respondingly generating electrical signals relative to received sonic energy wherein a driver

generates the sonic pulses; and an improvement for projecting the sonic energy in a peculiar controlled pattern is a wave guide interposed at the output of the driver for controlling the propagation of the pulses by setting up substantially a line source of sonic energy which emanates the sonic energy in an operating pattern of at least a minimum intensity near the point of greatest breadth of the pattern.



There has been provided an electromechanical transducer for projecting sonic energy in a peculiar pattern including a head mounted at the output of the transducer and a wave guide having a transverse slot therethrough adapted to cooperate with the head for directing the propagation of the sonic energy to substantially complete sonic coverage within a limited range.

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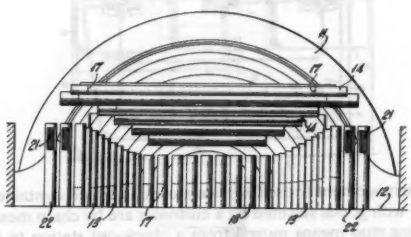
**3,672,463**

**ACOUSTICAL SYSTEM EMPLOYING TUBULAR RESONATORS**

**Christopher Jaffe, 167 E. Rocks Road, Norwalk, Conn., and Frank O. Gehry, 1524 Cloverfield Blvd., Santa Monica, Calif.**

**Filed Nov. 9, 1971, Ser. No. 196,914**
**Int. Cl. F01n** *1/02;* **E04b** *1/99;* **H04r** *1/28*
**U.S. Cl. 181—30** **15 Claims**



Improved dispersion of the sound from an orchestra toward an audience and reinforcement of the lower frequencies in said sound are achieved through the use of tubular resonators positioned around and above the orchestra. Resonating chambers are formed in the ends of the tubes by means of transverse partitions. Electrically-driven speakers may be positioned in said tubes.

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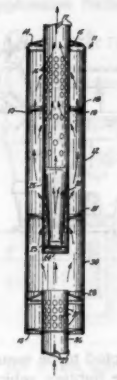
**3,672,464**

**MUFFLER FOR INTERNAL COMBUSTION ENGINE**

**Douglas W. Rowley, St. Paul, and John A. Campbell, Minneapolis, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.**

**Filed Sept. 16, 1970, Ser. No. 72,678**
**Int. Cl. F01n** *1/00*
**U.S. Cl. 181—44** **6 Claims**

A muffler for internal combustion engines which employs a converging-diverging nozzle and a length of perforated tubing to effect sound attenuation with minimum back pressure. The perforated tube is axially disposed in a cylindrical casing, projecting forwardly from the muffler outlet and defining alternate flow passages. The nozzle member is disposed in the perforated tube, its mouth positioned at the tube inlet and spaced downstream from the muffler inlet. An imperforate



baffle disposed in the annular passage between the perforated tube and cylindrical casing intermediate the ends of the nozzle member lengthens the passage with respect to the alternate, causing the divided gas flows to travel different distances prior to recombination and exhaust.

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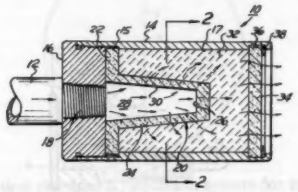
**3,672,465**

**GAS EXHAUST SILENCER**

**Leland Francis Blatt, and Frank H. Wiesenhofer, both of 31915 Groesbeck Highway, Fraser, Mich.**

**Filed Oct. 15, 1970, Ser. No. 81,051**
**Int. Cl. F01n** *1/10, 7/16*
**U.S. Cl. 181—50** **7 Claims**



An air exhaust silencer comprises a housing having an air inlet and an air outlet defined by baffle members made of a porous material; a sound absorbing material is disposed in the housing between the baffle members; the air enters through the inlet port and is broken up by the porous inlet baffle for distribution through the sound absorbing material and exhaust through the porous outlet baffle at which the air flow is further broken up to thereby considerably reduce the noise level of the exhausted air passing through the silencer.

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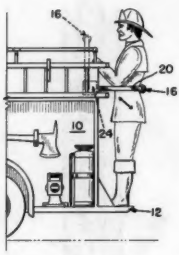
**ERRATUM**

For Class 181—58 see:
Patent No. 3,672,773

**3,672,466**
**SAFETY APPARATUS**
**Jacob C. Beck, Welcome, N.C., assignor to Safety Devices, Inc., Welcome, N.C.**
**Filed Jan. 4, 1971, Ser. No. 103,597**
**Int. Cl. E06c 7/18**
**U.S. Cl. 182—3** **9 Claims**




A safety apparatus adapted to be mounted above the rear support platform of a fire fighting vehicle for retaining fire fighting personnel thereon includes a safety bar mounted upon arm members which are displacable from a first position forwardly of the support platform to a second operative position wherein the bar is horizontally disposed rearwardly of fire fighting personnel standing upon the rear platform.

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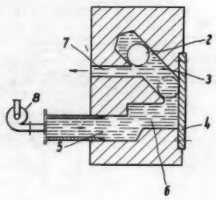
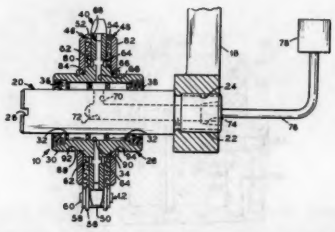
**3,672,467**
**APPARATUS, SUCH AS A DRAWING UNIT OR A CALENDER DRYER**
**Heinz Fleissner, Egelsbach, near Frankfurt am Main, Germany, assignor to Vepa AG, Basel/Schweiz, Switzerland**
**Filed July 28, 1970, Ser. No. 58,980**
**Claims priority, application Germany, Aug. 20, 1969, P 19 42 330.4**
**Int. Cl. F16n 3/00**
**U.S. Cl. 184—1 C** **7 Claims**




The present disclosure relates to an oil circulation indicating instruments which comprise a housing, a plurality of boreholes angularly disposed within said housing in an upwardly-downwardly direction, said boreholes communicating at their lower end with a common channel disposed in said housing, additional boreholes communicating with each of said angularly disposed boreholes and with the elements to be lubricated, a movable float means disposed in each of said angularly disposed boreholes and adapted to be raised to a point above said additional boreholes or lowered to a point below said additional boreholes, and a central lubricant supply pipe communicating with said common channel for the introduction of the lubricant thereto.

**3,672,468**
**LUBRICATING IDLER FOR ROLLER CHAINS OR THE LIKE**
**John D. Schuster, 6067 Sylvan Green Road, Sylvania, Ohio**
**Filed Aug. 3, 1970, Ser. No. 60,460**
**Int. Cl. F16n 7/12**
**U.S. Cl. 184—15 A** **6 Claims**



A lubricating device for a roller chain is provided. The device includes a sprocket for the roller chain with a pair of lubricating discs mounted on each side of the sprocket and extending a distance sufficient to engage the side plates of the chain when the teeth of the sprocket engage the chain. The lubricating discs preferably are slightly compressed when engaging the chain side plates to thereby be more effective in depositing lubricant on the chain. The lubricant can be supplied from a passage located centrally in an axle on which the sprocket and lubricating discs rotate, with passages extending radially through the sprocket and communicating with the lubricating discs and with the axle passage.

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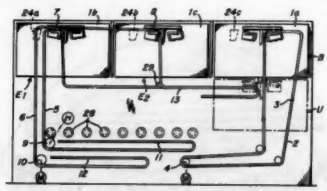
**3,672,469**
**DEVICE FOR SELF-SERVICE STORES**
**Werner Potrafke, Hufelsenstrasse 6, 4320 Hattingen, Germany**
**Filed Oct. 6, 1970, Ser. No. 78,474**
**Int. Cl. E04h 3/04**
**U.S. Cl. 186—1 A** **9 Claims**



An arrangement for self-service stores, in which containers loaded with goods selected by a customer are by chain means including stud means moved from a check-out station to an unloading station for withdrawal by the customer of the checked-out goods, while each container is provided with entraining means cooperating with stud means of said chain means, said entraining means being so controlled as to block and free the entraining means for respectively transporting and freeing the respective container.

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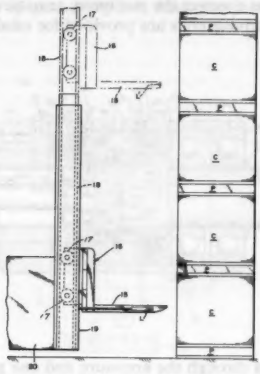
**3,672,470**
**PHOTOELECTRIC CONTROL FOR LOAD HANDLING DEVICE**
**Frederick F. Ohntrup, Plymouth Meeting, Pa., and Louis E. Pecsi, Dept Ford, N.J., assignors to Eaton Yale & Towne Inc., Cleveland, Ohio**
**Filed Nov. 26, 1969, Ser. No. 880,216**
**Int. Cl. B66b 9/00**
**U.S. Cl. 187—1** **8 Claims**

A load handling device carrying light sensitive means and a light source moves relatively to a load with a focused beam from the light source scanning the load. The light sensitive

means receives light of said beam reflected from the load, and any variations of the reflected light because of variations in the load, will cause the light sensitive means to particularly



condition a control circuit for the load handling device. By utilizing a light sensitive means such as two photoelectric cells, variations in ambient light do not significantly affect the operation of the light sensitive means and control circuit.

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**3,672,471**

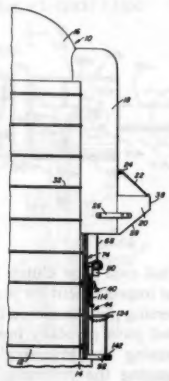
**SILO ELEVATOR**

**Leonard J. Badding, Vinton, Iowa, assignor to Veda, Inc., Long Lake, Minn.**

**Filed Nov. 13, 1969, Ser. No. 876,528**

**Int. Cl. B66b *11/04***

**U.S. Cl. 187—27** **23 Claims**



A silo elevator including a first stationary section for support from an upper portion of one side of a silo and a second section for movement up and down that one side of the silo. One of the sections includes guide means from which the central portion of an elongated flexible tension member is supported for longitudinal shifting relative thereto and the other section includes a pair of winding members driven at the same effective peripheral speed and upon which the opposite end portions of the tension member are wound. Further, the tension member and first section include coacting abutment means spaced along the path of movement of the central portion of the tension member relative to the guide means for limiting longitudinal shifting of the tension member relative to the guide means.

**3,672,472**

**VIBRATION DAMPERS FOR RAPIDLY ROTATING BODIES OF REVOLUTION**

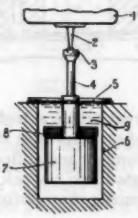
**Johannes Lagerwey, Leidschendam; Hendrik J. Ijlstra, Weesp, and George F. J. Andriesse, Amsterdam, all of Netherlands, assignors to Reactor Centrum Nederland, (Stichting), an Institute of the Netherlands**

**Filed Sept. 15, 1970, Ser. No. 72,257**

**Claims priority, application Netherlands, Sept. 22, 1969, 69.14317**

**Int. Cl. F16f *7/10***

**U.S. Cl. 188—1 B** **3 Claims**



Vibration damper for a fast spinning body of revolution, comprising a hermetically closed vessel, a damping member coupled with said body through a deformable wall portion of said vessel, an elastically compressible solid body contained in said vessel and liquid filling the space left in said vessel completely.

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**3,672,473**

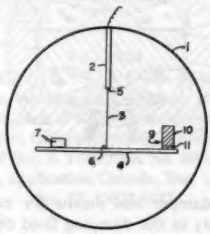
**PENDULUM SYSTEM**

**Cornelis M. Verhagen, c/o Datawell N.V., Zomerlustraat 4, Haarlem, Netherlands**

**Filed Dec. 30, 1970, Ser. No. 102,875**

**Int. Cl. F16d *57/00*; F16f *9/00***

**U.S. Cl. 188—266** **6 Claims**



The invention provides a pendulum system for stabilization purposes, provided with a liquid-filled vessel and a body suspended therein, said body being of synthetic material having a density deviating little from 1 g/cm³ the liquid being water containing substances such as glycerol, and/or sorbitol and/or glycol dissolved therein and the density difference of liquid and synthetic material being smaller than 1 percent of the material density in the temperature range from −5° C to +35° C.

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**3,672,474**

**FLUID FLOW DEVICE FOR A SHOCK ABSORBER**

**Endre A. Mayer, and Bernard R. Teitelbaum, both of Birmingham, Mich., assignors to The Bendix Corporation**

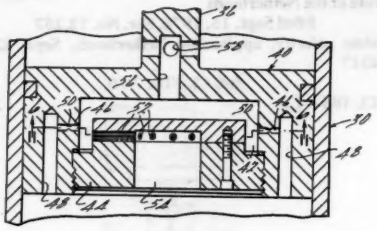
**Filed Feb. 16, 1970, Ser. No. 11,715**

**Int. Cl. F16f *9/34***

**U.S. Cl. 188—282** **7 Claims**

A fluid flow device which will produce a tailored flow-rate to pressure difference relationship including a laminar and an

orifice restriction connected to a radial and a tangential inlet respectively of a vortex valve, with both connected in parallel to the upstream pressure source. Flow across the assemblage will be such that the vortex valve will act like a smaller orifice at lower flows and a larger orifice at higher flows, or vice versa, due to the shifting of the respective shares of the total flow accommodated by the laminar and orifice restrictions. This arrangement is incorporated into a shock absorber to produce an improved output damping characteristic.



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**3,672,475**

**DASH POT INCLUDING TEMPERATURE SENSITIVE VALVE MEANS**

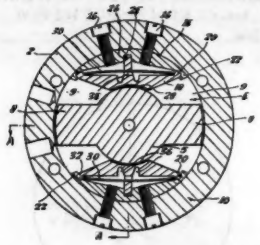
**Alan Richard Brine Nash, 39, Abbot's Ride, Farnham, Surrey, England**

**Filed July 7, 1970, Ser. No. 52,933**

**Claims priority, application Great Britain, July 7, 1969, 34,154/69**

**Int. Cl. F16f 9/52**

**U.S. Cl. 188—277** **9 Claims**



A dashpot or damper has means for compensating for changes of viscosity in the damping fluid due to changes of temperature. Restricted flow paths for the damping fluid that determine the damping force are composed in part of members that are displaceable with changes of temperature so that the cross-sectional areas of the flow paths vary at different temperatures and compensate at least partially for the concurrent fluid viscosity changes.

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**3,672,476**

**ELECTROMAGNETIC CLUTCH-BRAKE DEVICES**

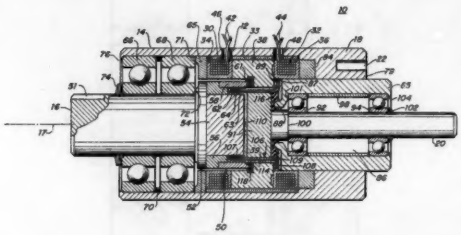
**James R. Hendershot, Amherst, N.H., assignor to Vibrac Corporation, Chelmsford, Mass.**

**Filed Sept. 4, 1970, Ser. No. 69,839**

**Int. Cl. F16d 37/02**

**U.S. Cl. 192—21.5** **18 Claims**

A combination magnetic particle clutch and brake device comprising a rotatable output shaft having a single magnetic coupling member mounted thereon for rotation therewith, the coupling member comprising a hollow cylindrical portion having an axis of rotation substantially coincidental with, the axis of rotation of the shaft and an annular portion extending substantially radially of the cylindrical portion. The brake section of the device includes a stationary magnetic armature and one of the portions of the member, while the clutch section includes a rotor and a stator and the other of the portions of the member. Means connect the stationary armature and the stator as a unit. Driving coils are provided for establishing magnetic flux paths through the armature and one portion of the coupling member and through the rotor and stator and the other portion of the coupling member. The armature and the rotor are spaced from and surround the coupling member so as to define a single continuous space which is filled with magnetic particles. Sealing means are provided for substantially preventing magnetic particles from escaping from the space.



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**3,672,477**

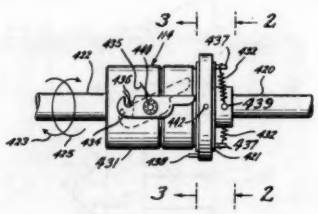
**CLUTCH**

**John J. Moran, Houston, Tex., assignor to Hycel, Inc., Houston, Tex.**

**Division of Ser. No. 737,065, June 14, 1968, Pat. No. 3,622,279. This application June 21, 1971, Ser. No. 154,988**

**Int. Cl. F16d 41/02, 41/07, 41/08**

**U.S. Cl. 192—27** **1 Claim**



In a spring loaded cam type clutch having a driving and driven member, the improvement for providing two-way drive by providing a reversing pin connected to one of the members and a spring loaded pawl pivotally mounted on the second member for bypassing the reversing pin in the forward direction, but engaging the reversing pin and driving the driven member in the reverse direction.

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**3,672,478**

**HYDRAULICALLY OPERATED WET-TYPE FRICTION CLUTCH**

**Hans-Walter Riese, Dittelbrunn, and Gerhard Friedrich, Schweinfurt, both of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany**

**Filed May 11, 1971, Ser. No. 142,133**

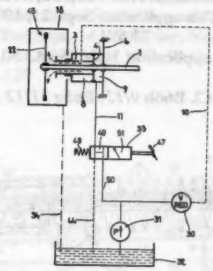
**Claims priority, application Germany, May 13, 1970, P 20 23 252.4**

**Int. Cl. F16d 25/00, 13/72**

**U.S. Cl. 192—86** **9 Claims**

The release mechanism of a wet-type friction clutch is actuated by a piston which divides the cavity of a cylinder into two

compartments. One compartment is connected to an oil pump through a control valve which either admits high-pressure oil to the compartment or vents the compartment to a sump. The other compartment is continuously supplied with oil under lower pressure by the sump pump through a pressure reducing



valve, and the oil flows from the other compartment to a nozzle which directs it toward the engageable friction faces of the driving and driven clutch members. When the high-pressure compartment is vented, the oil in the other compartment acts on the piston to retract the clutch release bearing from the release levers or the diaphragm spring of the clutch.

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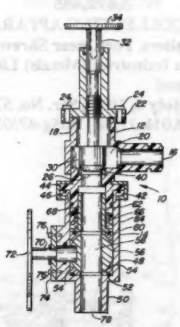
**3,672,479**

## APPARATUS FOR PROVIDING A PREDETERMINED VOLUME OF LIQUID

**Owen J. Schwertfeger, Chicago, and Frank D. Brill, Norridge, both of Ill., assignors to The Seeburg Corporation of Delaware, Chicago, Ill.**

**Filed Oct. 2, 1970, Ser. No. 77,546**
**Int. Cl. G07f *13/00***
**U.S. Cl. 194—13** **9 Claims**



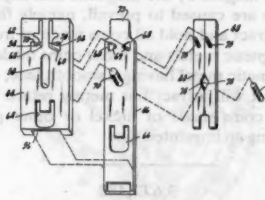
The intake orifice of a screw type valve is connected to a liquid reservoir. Mounted at the output orifice of the screw valve by detachable spring clips is a ball valve. The rate of liquid flow through the screw valve can be preset by adjustment of the handle of the screw valve. The ball valve may be actuated from an off to an on position for a preset period of time by an electrically actuated solenoid and linkage. The total volume of liquid flowing through the apparatus for each actuation of the solenoid is a function of the rate of liquid flow through the screw valve divided by the time of actuation of the ball valve.

**3,672,480**

## TAPE CARTRIDGE DISPENSER

**Louis John Crossien, Grafton, Wis., assignor to Frank Mayer & Associates, Inc., Grafton, Wis.**

**Filed July 23, 1970, Ser. No. 57,616**
**Int. Cl. G07f *5/00***
**U.S. Cl. 194—92** **10 Claims**



A tape dispenser including a drum having a plurality of tape cartridge boxes mounted on oppositely disposed vertical pins provided on the outer periphery of the drum, a flange positioned around the upper portion of the drum to prevent vertical movement of the boxes with respect to the pins and including a slot for removing one box at a time from the drum, a locking spring plate mounted to block the slot and having a release recess which is moved into alignment with the slot to allow for the vertical movement of a box on the pins, and a key actuated release mechanism connected to said locking spring plate and actuated by a lettered key which allows for movement of the locking plate to release a tape cartridge box from the drum. The release mechanism includes a slide housing having a pair of guide slots, an index slide positioned for movement in the housing and including a pair of triangular openings, a pair of arms mounted for movement with the slide and having rivets extending through said triangular openings and said guide slots, and a spring connected to the arms to bias said arms to a locking position with respect to said housing and slide. The special key is used to move the arms with respect to the slide to thereby release the slide for movement relative to the housing.

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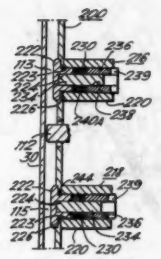
**3,672,481**

## VARIABLE MAGNETIC FLUX COIN-SENSING DEVICES

**Willard A. Hastie, Aylmer East, Quebec, and Austin Hastie, Ottawa, Ontario, both of Canada, assignors to Coin Verifiers Company Limited, Ottawa, Ontario, Canada**

**Filed Dec. 8, 1969, Ser. No. 883,131**
**Claims priority, application Canada, Dec. 6, 1968, 037,067**
**Int. Cl. G07f *3/02***
**U.S. Cl. 194—101** **17 Claims**



An improvement is herein provided, in a coin-sorting apparatus wherein a coin is caused to move down a chute defined by an inclined runway and a pair of substantially parallel plates. The improvement comprises a magnet having a

slide face physically and magnetically coupled to the magnet positioned in the chute so that a coin moving in the chute is in direct, sliding, face-to-face contact therewith. The magnet includes a magnetic flux adjusting means including a casing of a non-magnetic, non-magnetizable material, with the magnet and the magnetic flux adjusting means mounted in the casing, the magnet and the flux adjusting means being relatively slidably mounted with respect to each other. By adjusting the strength of the magnet by the magnetic flux adjusting means, two conditions are caused to prevail, namely firstly that the magnet will attract and hold all coins made of iron or steel or other ferromagnetic metals and those coins made of nickel or other paramagnetic metal having a smooth face; and secondly that the magnet will attract but merely retard the speed of movement of coins made of nickel or other paramagnetic metal and having an imprinted face.

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**3,672,482**

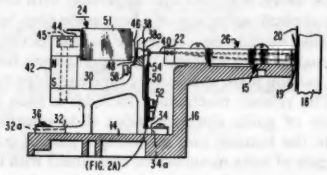
**WIRE MATRIX PRINT HEAD**

**Philip A. Brumbaugh, Endicott; Richard H. Harrington, Vestal; Stanley E. Nemier, Endicott, and Thomas C. Nielsen, Endwell, all of N.J., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Aug. 31, 1970, Ser. No. 68,278**

**Int. Cl. B41j *3/12***

**U.S. Cl. 197—1 R** **7 Claims**



A Z-shaped support having upper and lower shelves carries a plurality of electromagnetically controlled print wire actuators on its lower shelf for actuating a plurality of print wires which are attached to the actuator armatures and are converged into a vertical array by a wire guide attached to the upper shelf.

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**3,672,483**

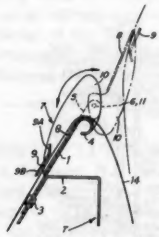
**CONTINUOUS STATIONERY GUIDE MEANS**

**Edward W. Gill, and Derek A. Vincent, London, both of England, assignors to Moore Business Forms, Inc., Niagara Falls, N.Y.**

**Filed Jan. 28, 1970, Ser. No. 6,358**

**Int. Cl. B41j *15/00***

**U.S. Cl. 197—133** **1 Claim**



Guide means for attachment to a typewriter so that continuous stationery can be guided to the platen of the typewriter comprises a backing plate which is adapted to be secured to the typewriter and a guide plate pivotally secured to the backing plate. The guide plate has a throat through which continuous stationery passes to the typewriter. The guide plate is pivoted upwardly, so that the leading edge of the continuous stationery is lifted from the platen, when it is required to type an additional letters and envelopes.

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**3,672,484**

**PASSENGER CONVEYOR**

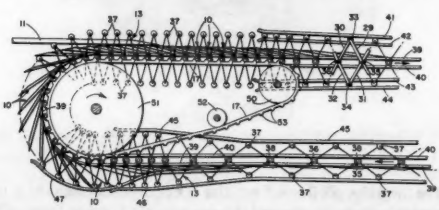
**Attilio E. Angioletti, and Sergio G. Marocco, both of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy**

**Continuation-in-part of Ser. No. 780,921, Dec. 3, 1968, Pat. No. 3,583,543. This application Sept. 21, 1970, Ser. No. 73,691**

**Claims priority, application Italy, Sept. 30, 1969, 22681 A/69**

**Int. Cl. B66b *9/12*; B65g *21/12***

**U.S. Cl. 198—16** **14 Claims**



A passenger conveyor having a high speed central zone joined at the respective ends by initial and terminal zones having gradually building up and slowing down speeds obtained by respectively elongating and shortening the support surface formed by the conveyor. The elongation and shortening takes place by virtue of the relative sliding movement of adjacent plates moved by a main drive means with which each plate engages and is temporarily connected thereto. The plates travel along a closed circuit and passenger convenience handles are also provided to move along with the plates to aid the passengers. The upper path of the conveyor is rectilinear while the lower return path has a rectilinear central portion and downwardly sloped end portions. Auxiliary drive means are provided at each end of the conveyor to transfer the plates between the upper and lower portions.

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**3,672,485**

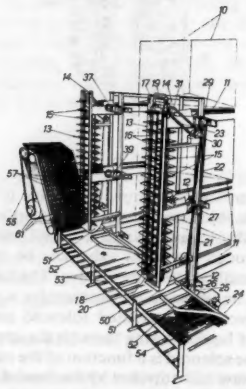
**EGG COLLECTING APPARATUS**

**Anthony George Walters, Ford, near Shrewsbury, England, assignor to Salopian Industries (Metals) Limited, Shrewsbury, Shropshire, England**

**Filed July 2, 1970, Ser. No. 52,053**

**Int. Cl. A01k *31/14*; B65g *47/08, 47/12***

**U.S. Cl. 198—26** **19 Claims**



Egg collecting apparatus for collecting eggs delivered to one end of a row of tiered battery cages by delivery conveyors

serving each tier, which apparatus includes an elevator which collects eggs from at least some of the delivery conveyors and discharges them all at one level.

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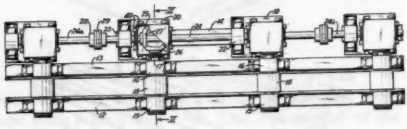
3,672,486

## ROLLER CONVEYOR

Frank Kennedy, Mount Lebanon Township, County of Allegheny, and Thomas C. Roberts, Johnstown, both of Pa., assignors to United States Steel Corporation

Filed Sept. 14, 1970, Ser. No. 72,056
Int. Cl. B65g *13/02*; F16h *57/02*
U.S. Cl. 198—127 8 Claims



A roller conveyor of the type in which the rolls are driven from a line shaft. The roll shafts and line shaft have cooperating bevel gears which are placed within light weight housings. All bearings in which the shafts are journaled are separate from the gear housings to avoid need for precision in constructing the housings. Each shaft is journaled in only a single "held" bearing, and the other bearings are "free" to enable the shafts to be shifted axially for adjustment or removal. The line shaft is formed in sections joined end-to-end.

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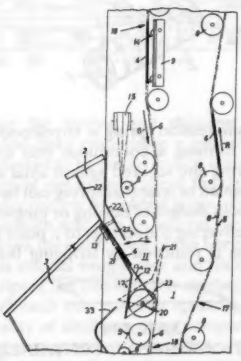
3,672,487

## VERTICAL CONVEYORS

Erich Schneider, Wiesensteig, Germany, assignor to Organisation Ralfs KG, Wiesensteig, Germany

Filed March 6, 1970, Ser. No. 17,242
Claims priority, application Germany, July 29, 1969, P 19 38 388.1
Int. Cl. B65g *15/4*
U.S. Cl. 198—165 7 Claims



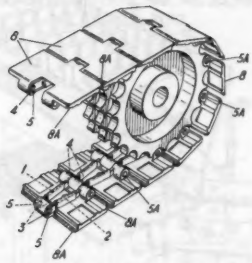
A vertical conveyor having a pair of endless belts forming a run between which articles are conveyed. Infeed and discharge chutes are located along the run at a point where one of the belts is removed to interrupt and expose the run. Switch means are provided at the exposed portion to divert the containers to or from the run.

3,672,488

## CONVEYORS

Bernard Collins, Stanmore, England, assignor to Bernard Collins Limited, Borehamwood, Hertfordshire, England

Filed Nov. 20, 1970, Ser. No. 91,435
Int. Cl. B65g *17/00*
U.S. Cl. 198—189 6 Claims



This invention relates to endless or continuous link conveyors having a series of platforms or supports linked to each other. The links in the present invention are fundamentally metal embedded within plastics materials, the exposed surfaces of the platform or support being of plastics material.

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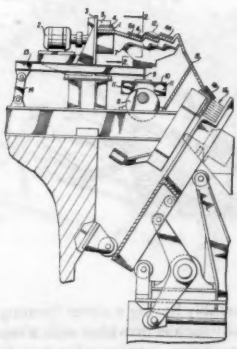
3,672,489

## EXIT ROLLWAY FOR ROLLED BARS OR RODS IN PARTICULAR FLAT OR PROFILED BARS, WITH TRANSVERSE CONVEYANCE DEVICE

Otto Karl Buchheit, St. Ingbert (Saar), Germany, assignor to Moeller & Neumann G.m.b.H., St. Ingbert (Saar), Germany

Filed Jan. 2, 1970, Ser. No. 46
Claims priority, application Germany, Jan. 4, 1969, P 19 00 447.8
Int. Cl. B65g *25/04*
U.S. Cl. 198—219 3 Claims



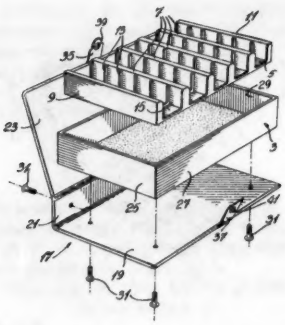
An exit rollway in particular for flat bars or rods, provides lateral conveyance of the moving bars or rods by means of an oscillating grate system known for cooling beds, wherein grate members extending from the stationary grate and from the displaceable grate are provided with a plurality of slide channel sections of equal lengths having chamfered entry ends.

3,672,490

## SLIDE LIBRARY ALBUM

Gerard Desmarais, and Claude Desmarais, both of Ville Mont Royal, Quebec, Canada, assignors to Desmarais & Frere Ltee, Montreal, Quebec, Canada

Filed May 18, 1970, Ser. No. 38,395
Int. Cl. B65d *85/48*; A45c *11/00*
U.S. Cl. 206—1 R 1 Claim



The invention relates to a slide library album of the type intended to hold a plurality of slides in rows inside the album and also possibly in small stacks in each row. The album comprises a container, slide holding tray which is received in the container and a case adapted to enclose the container with the slide holding tray. The assembly has means, such as split rivets, to fixedly amount the container on the case, and fastening means, such as a snap fastener, to close the case around the container with the slide holding tray. In this manner, when the case is closed, the slide library album can be stored upstanding on a bookshelf.

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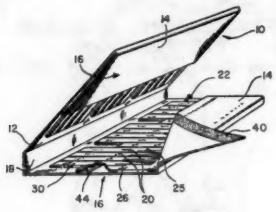
3,672,491

## PAPER MATCH BOOK ASSEMBLY

Jui-Chang Liu, Taipei, and Teng Chan, Nan Tu Sein, both of Taiwan, assignors to Lin-Huey Chang and Ya-Ya Hung, Taipei, Taiwan

Filed Oct. 8, 1970, Ser. No. 79,146
Int. Cl. A24g *27/12, 27/20*
U.S. Cl. 206—29 6 Claims



A match book assembly having a cover forming packets of match sticks, each of which is provided with a separate igniting means to insure proper ignition of a match when it is struck by being withdrawn from the packet. The packets are permanently closed to prevent accidental ignition of the unused matches as a match is being lit. The match sticks are formed by cuts through a paper board so that the heads of the match sticks are surrounded by the paper board sheet. Preferably, the match sticks are arranged in a plurality of groups, each group being separated from an adjacent group by a space in the paper board which is relatively wider than the space which separates each of the match sticks within a group. In addition, a side of each of the match sticks is defined in the paper board by misaligned, overlapping cuts through the paper board sheet. The length of the cut defining the head portion of the match stick is preferably less than the length of the cut defining the tail portion of the match stick, so that the strip between the cuts is disposed nearer to the head of the match stick than to the end opposite the head.

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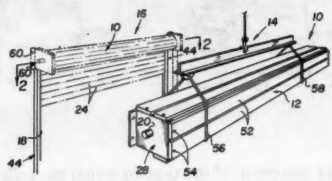
3,672,492

## FACTORY-ASSEMBLED OVERHEAD DOOR

Samuel Irving Sherr, Malverne, N.Y., assignor to North American Door Corp., Lindenhurst, N.Y.

Filed Feb. 9, 1971, Ser. No. 113,930
Int. Cl. B65d *85/20*; E06b *9/08*
U.S. Cl. 206—46 H 4 Claims



A factory -assembled overhead door, preferably of the "rolled steel" type, having side mounting members by which the door is mounted in place traversely along the top of a door opening. The side mounting members additionally cooperate with removable structure to form a protective enclosure about the door. This enclosure enables both safe transportation and greatly facilitated installation of the door since it provides protection against crushing or the like until after the completion of the installation of the door.

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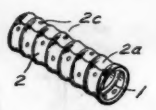
3,672,493

## FOIL WRAPPED COIL SPRING

Henry J. Modrey, Eagle Drive, Stamford, Conn.

Filed April 23, 1970, Ser. No. 31,075
Int. Cl. B65d *85/00*
U.S. Cl. 206—46 H 7 Claims



An open coil compression spring is enveloped by frangible pliable metal foil forming a continuous wall enveloping all windings of the spring and secured against axial sliding on the spring. A thus shrouded or wrapped spring can be packaged or stored in bulk without danger of nesting or tangling with other springs. Prior to delivering the springs to a point of utilization the shroud thereon is removed by stripping the foil off the spring.

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3,672,494

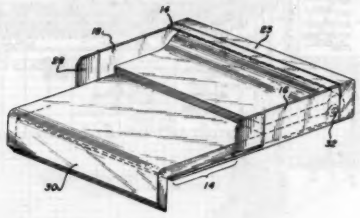
## COMBINATION SHIPPING CONTAINER AND DISPENSER FOR PLASTIC FILM

Harry P. Eichin, Western Springs, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 24, 1970, Ser. No. 49,367
Int. Cl. B65h *55/00*
U.S. Cl. 206—57 R 17 Claims

A plurality of plastic films such as plastic bags are packaged in a disposable, compact shipping container which also serves as a self-contained dispenser. The container-dispenser com-

bination comprises a generally rectangular carton having a substantially horizontal dispenser base panel when the combination is disposed in a normal dispensing position. The front end panel is integrally hinged to the dispenser base panel and is releasably openable so as to be coplanar therewith. An elongated leash rod is internally secured athwart and between the main panels near the rear end panel. A restraining member



cooperates with the leash rod to engage and restrain the plastic films folded thereover. One end section of the plastic film is overfolded on the leash rod and the other end section is overfolded on itself near the openable front end panel. For dispensing purposes the openable front end panel is opened, the adjacent films unfolded thereon and the innermost films successively pulled from the dispenser one-by-one.

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**3,672,495**

## PACKAGING EPITAXIALLY COATED SEMICONDUCTOR DISKS

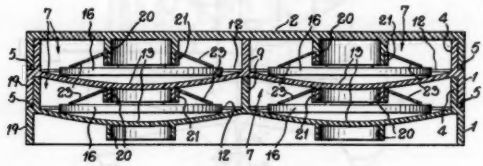
**Rudolf Bauer, Munich; Herbert Jacob, Burghausen, Upper Bavaria, both of Germany, and Werner Braun, Palos Verdes Peninsula, Calif., assignors to Wacker-Chemie GmbH, Munich, Germany**

**Filed Feb. 6, 1970, Ser. No. 9,228**

**Claims priority, application Germany, April 1, 1969, G 69 13118**

**Int. Cl. B65d *71/00***

**U.S. Cl. 206—65 F** **2 Claims**



A package for storing and shipping epitaxially coated semiconductor disks comprising a plurality of similar trays which are adapted to be nested one on top of the other. An upstanding vertical rim extends about the upper face of each of the trays and a narrow horizontal ledge extends about each of said trays beneath said rim. A second rim projects vertically downward from the outer edge of the horizontal ledge of each tray, and this rim fits snugly over and frictionally engages the upstanding rim of the tray which is stacked therebeneath. The upper face of each tray contains upstanding partitions which form a plurality of similar storage compartments in the tray. Each of said compartments has a flat horizontal floor and a circular dished portion for storing a semiconductor disk within such compartment. The said dished portion, which constitutes most of the floor of each compartment, has an outer rim sunk slightly below the outer flat part of the floor to restrain the semiconductor disk from being dislodged when said tray is placed on an incline. A cover is provided for the topmost tray, and a plurality of downwardly curved resilient petals are provided on the bottom of each tray for resiliently holding each semiconductor disk in its assigned storage compartment. Means are also provided to facilitate the insertion of forceps or tongs into the various compartments, when the nested trays are unstacked, to permit the semiconductor disks to be readily removed.

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**3,672,496**

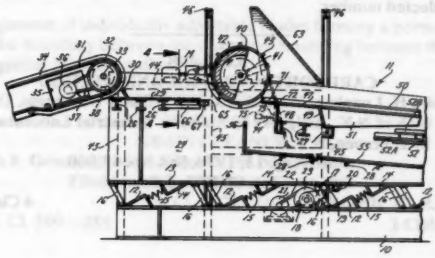
## SCRAP MATERIAL PROCESSING APPARATUS

**Robert M. Williams, Ladue, Mo., assignor to Williams Patent Crusher & Pulverizer Co., Inc., St. Louis, Mo.**

**Filed March 26, 1970, Ser. No. 22,990**

**Int. Cl. B03c *1/30***

**U.S. Cl. 209—38** **9 Claims**



Apparatus for processing scrap material in a manner to separate magnetic from non-magnetic material and unusable foreign materials from the magnetic material, and to control the size of the final product of magnetic material such that oversize magnetic material may be collected and recycled for further reduction.

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**3,672,497**

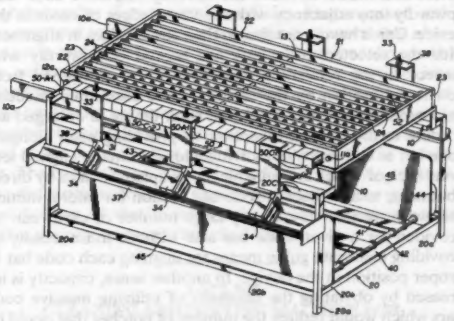
## RANDOM ACCESS ARTICLE SELECTION OF SYSTEM AND APPARATUS THEREFOR

**William J. Lambert, 2270 Boving Road, Lancaster, Ohio**

**Filed July 13, 1970, Ser. No. 54,352**

**Int. Cl. B07c *3/18***

**U.S. Cl. 209—80.5** **9 Claims**



Method and apparatus are disclosed for effecting selection of an article or item stored in a random access system. Each article or item is provided with codifying indicia in accordance with the selected number system with the indicia comprising two independent components that are termed "number" indicia and "complemental number" indicia. In an illustrative embodiment the articles comprise sheet-form cards which are formed with a series of key-form slots arranged along one marginal edge portion with each of the slots designed to incorporate and combine both the number indicia and the comple-

mental number indicia. Selection and removal of a numerically identifiable card is mechanically accomplished through selective operatiog of a similar number of selector bars with each bar cooperatively engageable with a respective key-form slot in the card. Mechanical minipulation of the selector bars in accordance with the selected number system effects a combined operation of retaining within a storage area all cards having a designating number greater than a selected number and retaining all cards having a designating number less than the selected number. In effect in this mechanical example, mechanical displacement of the selector bars in accordance with a specific numerical designation simultaneously releases all cards having a numerical designation less than this number as well as the card with the selected numerical designation and effects reengagement of the selected bars thus manipulated with all cards having a numerical designation less than the selected number.

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**3,672,498**

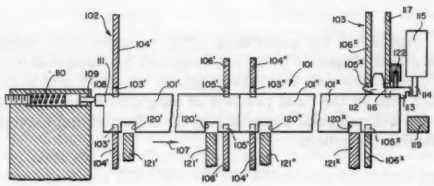
**CARD SORTING DEVICE AND METHOD**

**John H. Lanahan, Whitesboro, and William W. Abram, Utica, both of N.Y., assignors to Mohawk Industrial Laboratories, Inc., Vernon, N.Y.**

**Filed Aug. 11, 1970, Ser. No. 62,900**

**Int. Cl. B07c** *5/00*

**U.S. Cl. 209—80.5** **4 Claims**



The capacity of a card sorting device in increased. The device includes a card storage area for holding a plurality of edge-aligned cards in vertical orientation for separation of certain cards from the remaining cards. A plurality of elongate code bars are located below the lower aligned edges of the cards and extend transverse to the cards. The device includes means for displacing certain selected code bars laterally of the device and means to move the laterally displaced code bars upwardly into adjacency with the lower edges of cards in the device. Cards having notches in their lower edges in alignment with the selected code bars are moved downwardly with respect to the remaining cards which are restrained from downward motion by the selected code bars, thus effecting card separation. The capacity of such device is enlarged according to the present invention by providing each elongate code bar as a plurality of individual longitudinally aligned sections each of which is mechanically coupled, such as by direct abutment, to an adjacent code bar section for lateral motion therewith. In this way, a very large number of cards can be provided for a given code bar size without the necessity of providing elaborate guide means for aligning each code bar in proper position in the device. In another sense, capacity is increased by obviating the necessity of utilizing massive code bars which would reduce the number of notches that could be effectively provided in an edge of a given card.

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**3,672,499**

**MULTIPLE USE SORTING CARD**

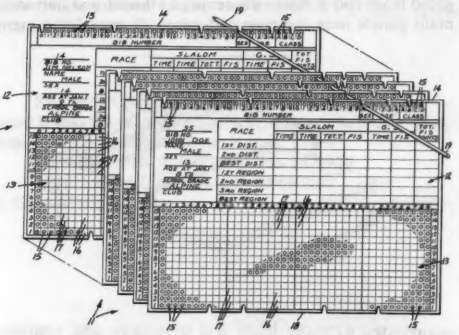
**Lorne W. Nelson, 10118 Dupont Ave. S., Minneapolis, Minn.**

**Filed Dec. 17, 1970, Ser. No. 99,082**

**Int. Cl. B07c** *5/06*

**U.S. Cl. 209—80.5** **7 Claims**

A multiple use information card for use with a plurality of other such cards in needle probe sorting. The card consists of a primary body portion having a peripheral edge in which information is encoded by punching, and a plurality of detachable row strips each of which represents a separate information field. The row strip disposed at the card periphery is punched with certain information, usually of a non permanent nature,



which permits its use as a data storing device in the sorting process. When the non permanent information has no further use the row strip is severed from the card, thus presenting a new peripheral edge and information field.

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**3,672,500**

**APPARATUS FOR GRADING PARTICLES ACCORDING TO THEIR SPHERICITY**

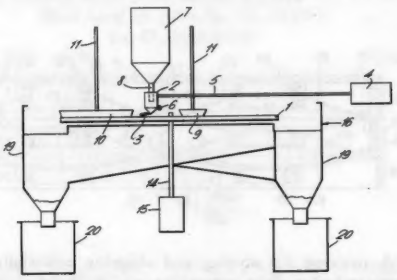
**Michael Richard Hayes, Kirkham, England, assignor to United Kingdom Atomic Energy Authority, London, England**

**Filed Aug. 21, 1970, Ser. No. 65,963**

**Claims priority, application Great Britain, Aug. 25, 1969, 42,231/69**

**Int. Cl. B07b** *13/10*

**U.S. Cl. 209—116** **6 Claims**



Particles, such as nuclear fuel particles, are graded according to their sphericity by feeding them at a controlled rate to the central region of a rotating table and collecting them in a collector as they drop over the edge of the table. A double hopper system is provided, the lower one of which may be vibrated, so that particles can be fed by gravity one after the other to the table.

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**3,672,501**

**EGG STABILIZER**

**Otto C. Niederer, Bear Tavern Road, Titusville, N.J.**

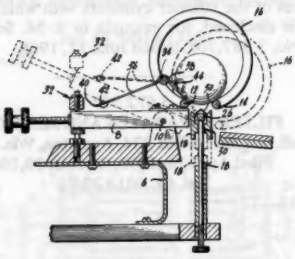
**Filed Dec. 21, 1970, Ser. No. 99,955**

**Int. Cl. A01k** *43/00*

**U.S. Cl. 209—121** **17 Claims**

Equipment for grading eggs by weight wherein a balance beam is provided with an egg support on which an egg to be weighed is deposited by egg moving means. Means are located

adjacent and above the egg support in position to be engaged by an egg deposited on the support and serve to stabilize and position the egg with respect to the balance beam so as to render the weighing operation more accurate and permit increased speed in operation of the equipment. The egg stabilizing means also cooperates with egg discharging means located below the egg support to aid in discharging an egg from the egg support when the balance beam is tilted.



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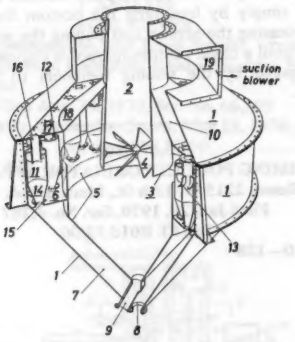
**3,672,502**
**APPARATUS FOR PURIFYING DUST LOADED WASTE GASES**

**Hans Jurgen Janich, Beckum, Germany, assignor to Polysius G.m.b.H., Neubeckum, Germany**

**Continuation of Ser. No. 783,469, Dec. 13, 1968, abandoned. This application March 27, 1970, Ser. No. 20,873**
**Int. Cl. B04c** *5/28*
**U.S. Cl. 209—144** **5 Claims**




An apparatus for purifying waste gases of furnaces, which comprises a substantially centrally located waste gas feeding pipe leading into a pre-separator and having twist producing means arranged in its lower end while cyclones distributed around said pre-separator have inlet means communicating with said pre-separator and also have first outlet means for releasing fine separated dust into a collecting chamber and furthermore have second outlet means communicating with a purified gas collecting chamber.

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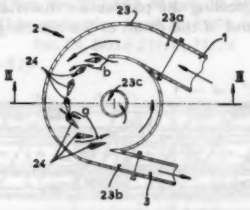
**3,672,503**
**CENTRIFUGAL SEPARATOR FOR FIBROUS MATERIAL**

**Andre Mark, 54, Cours Lafayette, 69, Lyon, Rhone, France**

**Filed May 15, 1969, Ser. No. 824,949**
**Claims priority, application France, May 15, 1968, 6850019**
**Int. Cl. B04c** *1/00*
**U.S. Cl. 209—144** **2 Claims**

A centrifugal separator with a circular inner chamber and an outer chamber of decreasing cross section from a relatively large tangential inlet to a relatively small tangential outlet. The two chambers communicate through a semicircular arrangement of individually adjustable blades forming a portion of the boundary between the chambers extending between the tangential inlet and outlet.



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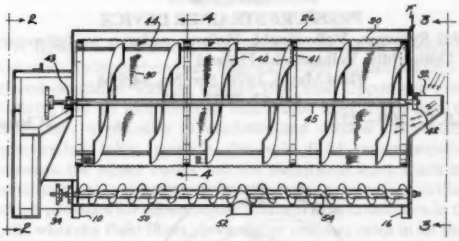
**3,672,504**
**GRAIN CLEANER**

**Dale F. Grimes, Jr., 924 Edwards, St. Marys, Ohio**

**Filed March 5, 1970, Ser. No. 16,892**
**Int. Cl. B07b** *1/24*
**U.S. Cl. 209—255** **1 Claim**



An apparatus for cleaning grain including a partially open-ended elongated cylindrical screen cage for receiving grain. A grain inlet chute and a grain outlet chute are disposed at the respective ends of the cage. The screen cage has a mesh slightly smaller than the grain particles. Encompassed within the cage and secured thereto is a grain feed screw that churns the grain and feeds it through the cage from the inlet chute to the outlet chute. As the grain is so moved, dirt particles intermixed in the grain fall through the sides and bottom of the cage onto a dirt receiving receptacle disposed below the cage thereby cleaning the grain. Disposed in the dirt receptacle is a feed screw that feeds dirt to a dirt outlet chute in the receptacle. The cage may have an exhaust fan for removing dust and fine dirt particles from the cage to further clean the grain. In a modification of the invention, the grain feed screw rotates within the cage and is not attached thereto.

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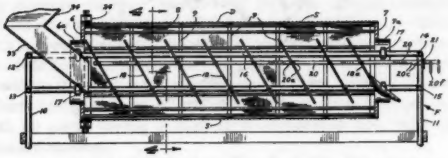
**3,672,505**
**CLEANING AND SORTING MACHINE FOR PARTICULATE MATERIALS**

**Leon G. Feterl, Salem, S. Dak.**

**Continuation-in-part of Ser. No. 801,729, Feb. 24, 1969, abandoned. This application Aug. 31, 1970, Ser. No. 68,311**
**Int. Cl. B07b** *1/24*
**U.S. Cl. 209—264** **8 Claims**

A cleaning and sorting machine for removing particle trash, such as dockage, from desired larger particulate material of substantially uniform size, employs an elongate and generally cylindrical driven separating drum having a screen periphery of a predetermined mesh, for retaining the desired larger particles. The drum, mounted on a horizontal axis, has mounted

therein a series or multiplicity of stationary slide baffles with peripheries of said baffles in spaced relation to the inner periphery of the drum and the baffles are declined from their upper portions to their lower portions in the direction of discharge of the machine, and constitute the only means for moving or progressing the particulate material from the entrance at one end of the drum to the discharge at the other



end. The screen successively lifts particles over a substantial segmental area of the drum and thereafter, with gravity, dropping all particulate material upon the baffles with attendant rolling and sliding action and the said declined baffles are preferably densely perforated with sieve-like apertures of substantially the mesh of the drum screen to constitute a further separation step in the progress of all particulate material through the machine.

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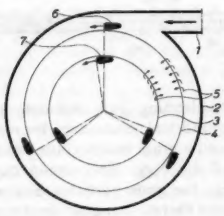
**3,672,506**
**PRESSURE STRAINER DEVICE**
**Ahti Syrjanen, Valkeakoski, Finland, assignor to Jylhavanra Osakeyhtio, Valkeakoski, Finland**
**Filed May 6, 1970, Ser. No. 34,974**
**Int. Cl. B07b 1/20**
**U.S. Cl. 209—273** **2 Claims**



A pressure strainer for cellulose, paper or equivalent pulp suspension, comprising two concentric strainer cylinders for passing acceptable pulp under pressure from the outside of the outer cylinder and from the inside of the inner cylinder into the space between cylinders, whereat in connection with each cylinder there has been provided at least one blade revolving about the cylinder' common axis and having a substantially drop-shaped cross section and which sweeps close to the surface of the strainer cylinder on the side where the pump to be strained is located, whereby the blades in the course of their motion produce in the strainer cylinder with their leading end a pressure pulse and with their trailing end, a vacuum pulse. The blades in association with different strainer cylinders are located with such displacement with reference to each other, or have such mutual angular spacing, that the pressure pulse from the blade of one of the two strainer cylinders enhances the vacuum pulse from the blade of the other strainer cylinder.

Owing to the use of two concentric straining cylinders, large effective straining surface is achieved, in comparison with the size of the device. The blades which sweep close to the surface of the strainer cylinders cause, owing to their drop-shaped form, in the strainer cylinder pressure pulse, or a pressure wave circling around the strainer cylinder, which boosts the flow of acceptable pulp through the strainer cylinder. With their trailing end, again, they produce a vacuum pulse, or a vacuum wave circling around the strainer cylinder, which detaches from the cylinder any larger particles, or particles to be rejected, which adhere to its surface, so that these cannot plug the holes in the strainer. A strainer device illustrative of the use of essentially drop-shaped blades which sweep close to the surfaces of the strainer cylinders with which they are associated, is disclosed, for example in S. M. Solomon et al., U.S. Pat. No. 3,387,708, issued June 11, 1968.

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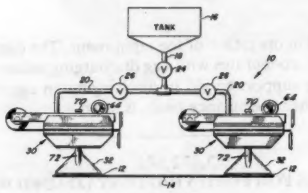
**3,672,507**
**FILTER APPARATUS AND METHOD**
**Henry Paull, Jr., Rte. 4, Box 334, Appleton, Wis.**
**Filed April 20, 1970, Ser. No. 30,103**
**Int. Cl. B01d 29/02**
**U.S. Cl. 210—77** **11 Claims**




An apparatus and method for filtering hot fluid material including a filter system having a filter formed from a continuous screen passing through a closed cavity through which the material flows. The cavity is defined by a cover and bottom member having sealing members which engage the screen to define the filter portion of the screen disposed within the cavity. The filter may be changed rapidly without cooling of the filter unit simply by loosening the bottom from the cover thereby releasing the screen and pulling the screen through the cavity until a clean portion thereof is disposed in position to be engaged by the sealing members to form a filter therefrom.

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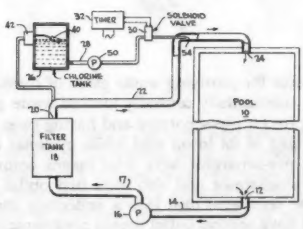
**3,672,508**
**SWIMMING POOL CHLORINATOR APPARATUS**
**James O. Simon, 2215 W. 12th St., Marion, Ind.**
**Filed Jan. 20, 1970, Ser. No. 4,287**
**Int. Cl. B01d 35/00**
**U.S. Cl. 210—128** **5 Claims**




The automatic apparatus for chlorinating a swimming pool utilizes a timing device for actuating a solenoid valve to enable chlorine, which is supplied by gravity from a chlorine tank, to enter the circulating line at a point either before or after the circulating pump which directs fluid from the pool to the filter tank. In a preferred embodiment, the chlorine enters the circulating line at the output side of the filter tank. A check valve may be substituted for the solenoid valve in which case a chlorine pressure pump is installed between the chlorine tank and the check valve.

3,672,509

## DIALYSIS APPARATUS

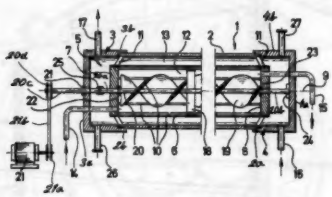
Paul Buchmann, Basel, Switzerland, and Monique Beringer, St. Louis, France, assignors to Solco Basel AG, Basel, Switzerland

Filed June 22, 1970, Ser. No. 48,113

Claims priority, application Luxembourg, July 8, 1969, 59.061

Int. Cl. B01d *13/00*

U.S. Cl. 210—321 2 Claims



A dialysis apparatus having at least one unit in which an outer generally cylindrical tube forms a through-flow vessel closed at its ends with caps provided with inlet and outlet conduits for the fluid. A semipermeable foil or membrane forms an inner coaxial tube and is supported within the outer tube while having means for passing another liquid through its interior. The dialysis unit may be ganged in banks connected in cascade, the banks being shiftable to afford access to the individual units for replacement or otherwise.

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3,672,510

## FUEL FILTER

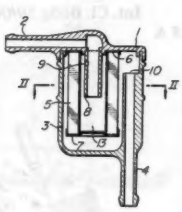
Nobuo Saito, Saitama-ken, and Kyoji Namiki, Urawa, both of Japan, assignors to Kabushiki Kaisha Tsuchiya Seisakusho, Toyko, Japan

Filed Aug. 24, 1970, Ser. No. 66,309

Claims priority, application Japan, May 19, 1970, 45/42090

Int. Cl. B01d *29/00*

U.S. Cl. 210—438 4 Claims



A fuel filter for engines of automobiles comprising a closed casing, a filter element in the casing, a fuel inlet pipe extending through the wall of the casing and opening in the casing for introducing the fuel to be filtered into the space around the element, and a fuel outlet pipe extending through the wall of the casing and opening within the filter element at a level lower than that of the opening of the fuel inlet, the said fuel outlet pipe being formed with a small by-pass opening in the upper portion of the wall of the fuel outlet pipe extending in the filter element, so that the water content of the fuel when accumulated and frozen in a cold season will not clog the fuel inlet of the filter, and that sufficient fuel supply for a cold start of the engine will be ensured through the said by-pass opening.

3,672,511

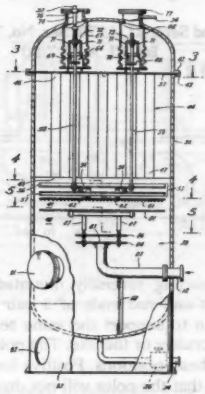
## TREATER FOR RESOLVING DISPERSIONS

Frederick D. Watson, and Joseph D. Winslow, Jr., both of Houston, Tex., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 717,133, March 29, 1968, Pat. No. 3,528,907. This application April 20, 1970, Ser. No. 29,811

Int. Cl. B01d *21/10, 21/24*

U.S. Cl. 210—519 8 Claims



A treater for resolving a dispersion containing immiscible external (hydrocarbon) and internal (water) liquid phases in a closed container with an upright flow axis. Upper and lower outlets, and an intermediate distributor inlet, open into the container. A plurality of unobstructed vertical cells having open-ended inlets provide the sole fluid communication between the upper outlet and the distributor inlet. Each cell terminates at a transverse header having metering orifices which provides for substantially uniform flow conditions in the cells whereby fluid flows upwardly at uniform rates in all fluid flowing through the cells toward the upper outlet of the container.

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3,672,512

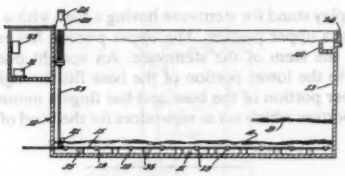
## STATIC THICKENER AND HYDRAULIC RAKE THEREFOR

Roy H. Werner, Pittsburgh, Pa., assignor to Barrett Haentjens & Co., Coraopolis, Pa.

Filed Aug. 6, 1970, Ser. No. 61,688

Int. Cl. B01d *21/24*

U.S. Cl. 210—523 4 Claims



Hydraulic rake for water treatment settling basins of static thickeners. The rake includes a series of statically mounted pipes arranged along the basin, below the sludge level in the basin, in a pattern to provide uniform coverage of the entire floor area of the basin. Fluid pressure or electrically operated valves are connected with certain of the pipes to selectively connect the pipes to the intake of an underflow pump. One pipe may be connected to the pump through its open valve to

remove the settled matter above it through spaced nozzles in the pipe. A next pipe may then be connected to the underflow pump to remove the settled matter above it. This is repeated in a preselected order to completely rake or sweep the floor of the basin and remove solids as settling down toward the basin floor.

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**3,672,513**

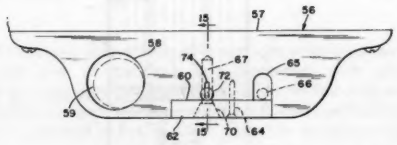
**FISHING POLE SUPPORTS**

**Franklin D. Riddle, Greenville, S.C., and John T. Willis, Miami, Fla., assignors to Southern Machinery Company, Green, S.C.**

**Filed Sept. 21, 1970, Ser. No. 73,999**

**Int. Cl. A47f 7/00**

**U.S. Cl. 211—60 R** **3 Claims**




A pair of coacting reversely mounted support brackets receive the butt and rod ends of a pair of fishing poles in reverse direction to support the same securely beneath the roof of a cabin cruiser or the like. The poles are stored out of the way in overhead positions. Positive locking means on the brackets assure that the poles will not drop due to vibrations or movement of the boat. The locking means are releasable manually.

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**3,672,514**

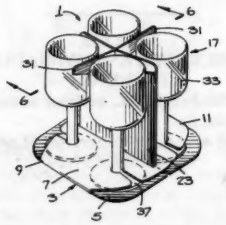
**BLANK AND DISPLAY STAND FOR STEMWARE**

**William Henry Tucker, Columbus, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio**

**Filed Aug. 3, 1970, Ser. No. 60,560**

**Int. Cl. A47j 47/16; A47g 29/00**

**U.S. Cl. 211—73** **2 Claims**




A display stand for stemware having a base with a floor portion and a upper portion. The upper portion has recesses to receive the stem of the stemware. An upright portion connected to the lower portion of the base fits through a slot in the upper portion of the base and has fingers mounted on its upper portion which act as separators for the bowl of the stemware.

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**3,672,515**

**PALLET STORAGE SECTIONAL FRAME STRUCTURES**

**Pierre Rous, 61, Boulevard Carnot, 31 Toulouse Haute Garonne, France**

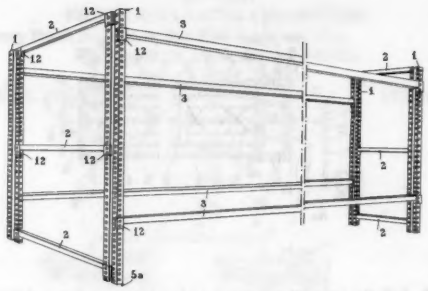
**Filed Dec. 7, 1970, Ser. No. 95,671**

**Claims priority, application France, Dec. 15, 1969, 6943321**

**Int. Cl. A47f 5/10**

**U.S. Cl. 211—176** **5 Claims**

This frame structure intended more particularly for the storage of palletized loads comprises uprights of substantially rectangular cross-sectional contour with a waisted or constricted formation centrally of the major faces which constitutes an inner reinforcing rib and consequently an external groove, with spaced perforations formed throughout the height of the upright in the two portions of said major faces which are separated by said groove and also in the minor faces thereof, whereby, when the uprights are disposed with their minor faces parallel to the front and rear faces of the frame




structure, and by pairs across said front and rear faces, each pair being interconnected by a cross member and adjacent pairs by longitudinal members, a frame structure comprising two or more rows disposed in the front-to-rear direction can be obtained, each upright being also adapted to receive two longitudinal members at a same level or at different levels in said two portions, said cross members and longitudinal members being formed with end lugs engageable in said perforations.

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**3,672,516**

**MACHINE FOR SEPARATING A SHEET FROM A SHEET PILE**

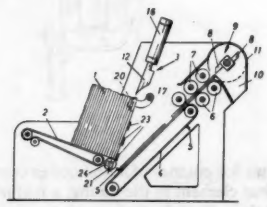
**Leif Roland Nordstrand, Malmo, Sweden, assignor to Kamas Kvarnmaskiner AB, Malmo, Sweden**

**Filed Sept. 21, 1970, Ser. No. 73,972**

**Claims priority, application Sweden, Sept. 23, 1969, 13047/69**

**Int. Cl. B65g 59/00**

**U.S. Cl. 214—8.5 A** **4 Claims**




A method and a machine for separating a sheet from a bale of sheets of paper pulp and the like while using a separation body having wedge-shaped configuration in side projection, the said body being adapted to penetrate into the bale while cutting off one sheet therefrom. The bale of sheets is supported during the separation process by two sets of arms which are movable on continuously driven chains into alternative contact with the bale.

3,672,517

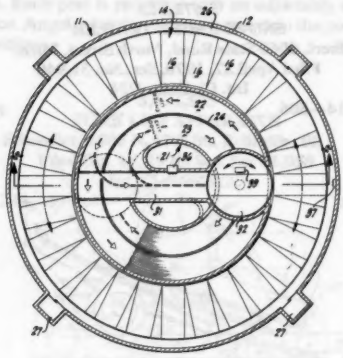
## ROTARY VEHICLE PARKING SYSTEM WITH RAMP AND TURNTABLE ARRANGEMENT

Charles R. Salloum, 120 Ellis St., San Francisco, Calif.

Continuation-in-part of Ser. No. 750,952, April 12, 1968, Pat. No. 3,613,909. This application April 1, 1970, Ser. No. 24,699

Int. Cl. E04h 6/06

U.S. Cl. 214—16.1 A 7 Claims



A multilevel parking system employing rotary parking platforms for maximized parking density and particular ramp and turntable arrangements for simplified access and egress with improvement economy of construction.

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3,672,518

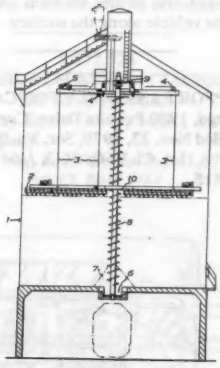
## ARRANGEMENTS IN SILOS FOR STORING VAULT-FORMING MATERIALS

Sven A. Andersson, Malmo, Sweden, assignor to Ingeniorsfirman Nils Weibull AB, Malmo, Sweden

Filed May 19, 1970, Ser. No. 38,808

Int. Cl. B65g 65/38

U.S. Cl. 214—17 DB 4 Claims



In silos for storing freely running materials with a tendency to form vaults when taken out of such a silo or container through a bottom opening by means of a horizontally rotating scraper, the arrangement of a central vertical rotary screw and preferably means for removing and replacing any broken part of the shaft of such a screw without the need of emptying said container for repair.

3,672,519

## CHARGING CAR FOR COKE OVENS

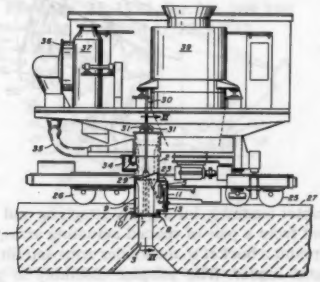
Erich E. W. Pries, Bochum, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Aug. 5, 1970, Ser. No. 61,167

Claims priority, application Germany, Feb. 27, 1970, P 20 09 300.9

Int. Cl. F23k 3/00

U.S. Cl. 214—35 R 5 Claims



A charging car for coke ovens of the type in which coke is conveyed through feed pipes into holes extending through the tops of the ovens, characterized in that the covers can be removed from the holes, coal charged into the ovens and the covers replaced without permitting the escape of dust and smoke into the atmosphere. This is accomplished in accordance with the invention by means of gripping devices which are located in housings connected to the sides of sleeves which surround the feed pipes. These gripping devices are pivotal from vertical positions to horizontal positions to remove or replace charge hole covers which normally cover the charge holes extending through the tops of the ovens.

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3,672,520

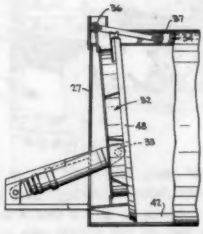
## REFUSE PACKER BODY

Roy Norman Linville, Richmond, Va., assignor to Truck Equipment Corporation, Richmond, Va.

Filed Aug. 14, 1970, Ser. No. 63,850

Int. Cl. B65f 3/00

U.S. Cl. 214—82 10 Claims

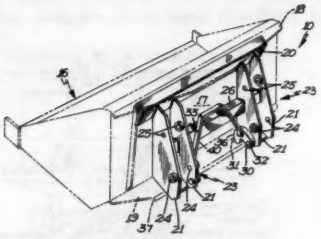


Refuse packer body for the accumulation and compaction of refuse has a tilting packer blade that permits the over-all length of the packer body to be shortened and the center of gravity of the loaded body to be moved forward.

### 3,672,521
### QUICK ATTACHMENT DEVICE

James J. Bauer, Lisbon, N. Dak.; James L. Werner, De Lamere, N. Dak., and Leland E. Erickson, Milnor, N. Dak.

Continuation-in-part of Ser. No. 772,695, Nov. 1, 1968, abandoned. This application Nov. 5, 1969, Ser. No. 874,235
Int. Cl. B66f 9/00
U.S. Cl. 214—145 9 Claims

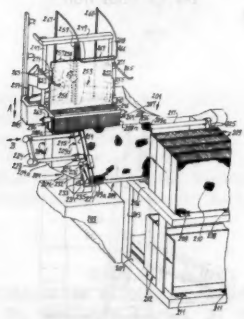


An adapter assembly for quickly attaching and releasing an implement from a pair of spaced actuating arms, useful typically to mount a bucket to the loader arms and tilt cylinders of a front-end loader. The adapter assembly is permanently pinned to the loader arms and tilt cylinders of the front-end loader and releasably attached to the bucket. It is characterized by an elongate member extending substantially the distance between the loader arms and means spaced from the elongate member for releasably securing the adapter assembly to the bucket. The elongate member seats under an acute overhang at the upper rear wall of the bucket and the lower portion of the adapter is releasably secured to a protruding shelf at the lower rear wall of the bucket.

### 3,672,522
### APPARATUS FOR FEEDING ROD SHAPED ARTICLES TO CONSUMING MACHINES

Gunter Wahle, Hamburg, and Alois Kasparek, Reinbek, both of Germany, assignors to Hauni-Werke Korber & Co. Kg., Hamburg, Germany

Filed July 30, 1970, Ser. No. 59,493
Claims priority, application Germany, Aug. 2, 1969, P 19 39 395.4
Int. Cl. B65g 1/08
U.S. Cl. 214—302 10 Claims

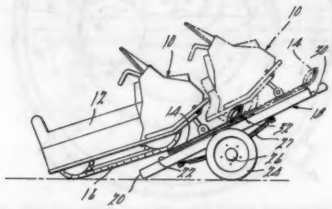


A feeding apparatus which delivers batches of arrayed cigarettes to the magazine for a packing machine. The panels of the magazine are formed with vertical recesses for the rigid bars of a confining device which supports an inverted cigarette tray during evacuation of its contents into the magazine. The tray can be lifted and lowered by a frame at the upper end of the confining member. The internal surfaces of the bars are flush with the internal surfaces of the respective panels of the magazine and the width of as well as the distances between the bars which are adjacent to the ends of the cigarettes are less than the diameter of a cigarette. The lateral walls of the confining device may comprise single or twin bars whereby the length of a cigarette exceeds the width of a single bar or the distance between the twin bars.

### 3,672,523
### SNOWMOBILE TRAILER

Fred R. Albert, 6060 State Road, North Street, Mich.

Filed April 27, 1970, Ser. No. 31,940
Int. Cl. B60p 1/28
U.S. Cl. 214—506 6 Claims

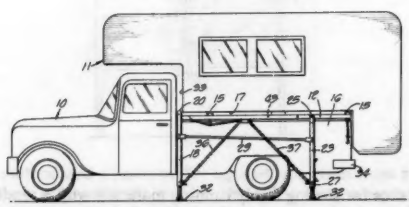


In combination with an apparatus for transporting snowmobile vehicles having one or more ski-like members, means on the apparatus defining a snowmobile vehicle support surface, a retaining element for releasably securing a snowmobile vehicle upon the surface, means for supporting the element for movement between a retracted position extending generally coplanar with the surface and an elevated position projecting upwardly from the surface and adapted for engagement with the ski-like member of a snowmobile supported on the surface, and means for resiliently biasing the element toward the elevated position, whereby a snowmobile vehicle may be traversed forwardly along the surface and the element will be biased to the retracted position as the ski-like member travels thereover, and the element will be biased to the elevated position once the member has traveled thereacross and will engage the rearward end of the member to prevent rearward movement of the vehicle along the surface.

### 3,672,524
### SUPPORT ASSEMBLY FOR CAMPER

Martin B. Conrad, 1980 Paquita Drive, Carpinteria, Calif.

Filed Nov. 23, 1970, Ser. No. 91,954
Int. Cl. B60p 3/32, 1/64
U.S. Cl. 214—515 1 Claim



A support assembly for a camper unit normally carried on the body of a pickup truck is provided with laterally spaced horizontal side rails. These side rails rest on the truck body and support the camper unit along its side edges. Two forward

posts are secured to a transverse horizontal member at their upper ends and this member is pivotally connected to the side rails at their forward ends. Two rear posts are each pivoted at the upper end to one of the side rails, respectively, and a second transverse horizontal member extends between the rear posts and is secured to them at a location below their pivotal connections to the side rails. A pair of tie rods each pivotally connect a forward post to a rear post. The camper unit may thus be raised off the truck body by resting the lower ends of the posts in inclined position on the ground and then moving the truck body rearward to bring the posts to vertical position. Each post is provided with an adjustably extensible foot piece. Angular tension elements maintain the posts in vertical position.

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**3,672,525**

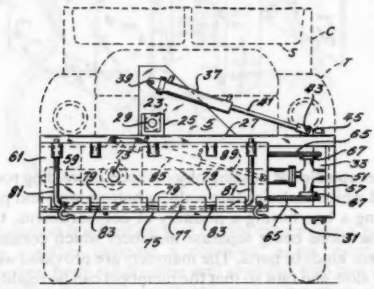
**FORK LIFT APPARATUS**

**Alvin C. Schaedler, 1005 N. 17th St., Belleville, Ill.**

**Filed Oct. 15, 1970, Ser. No. 81,058**

**Int. Cl. B66f 9/20**

**U.S. Cl. 214—674** **13 Claims**



A fork lift apparatus for mounting on the front of a highway truck has its mast structure arranged to pivot about a longitudinal axis on the front of the truck for movement from a low-level horizontal traveling position to vertical and longitudinally inclined operating positions, mounting the fork supporting apron on the mast for pivoting about a longitudinal axis to provide for transverse tilting of the forks, and pivotally mounting the forks in variable positions on the apron for pivoting about vertical axes to permit their folding to a position transverse of the truck when they are not in use.

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**3,672,526**

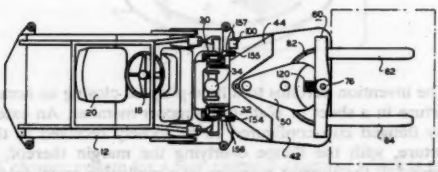
**FRONT AND SIDE LOADING ATTACHMENT FOR LIFTING TRUCKS**

**Howard C. Hansen, Battle Creek, Mich., assignor to Clark Equipment Company**

**Filed Aug. 6, 1970, Ser. No. 61,672**

**Int. Cl. B66f 9/14**

**U.S. Cl. 214—730** **19 Claims**



A front and side loader attachment for lift trucks with an upright in which the fork section is connected to the upright by a member movable angularly in a horizontal plane from one side of the carriage to the other side. The member is pivoted at one end on a line substantially in the longitudinal center of the carriage, and the fork section is movable to and from lateral positions on a line perpendicular to the longitudinal center line and is adapted to be skewed to various angles between the two lateral positions. A load distributing system is preferably incorporated in the carriage consisting generally of spaced racks mounted on the upright and one or more shafts with pinions meshing with the racks.

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**3,672,527**

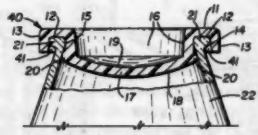
**PLASTIC CLOSURE FOR CONTAINERS**

**Ray E. Bly, Golden, Colo., assignor to Adolph Coors Company, Golden, Colo.**

**Filed Jan. 25, 1971, Ser. No. 109,210**

**Int. Cl. B65d 41/22, 41/32**

**U.S. Cl. 215—41** **6 Claims**



A plastic closure for containers comprising a top provided with depending inner and outer skirts, said skirts having facing surfaces which non-sealingly contact surfaces of a bottle neck adjacent its edge, said inner skirt merging into an annular radially projecting sealing member surrounding and integral with a concavo-convex closure web, said sealing member engaging a restricted area of the inner surface of the bottle neck. The closure may be removed by use of a cap lifter or the top of the closure may be provided with weakening means which divide the top into an outer and an inner ring, the outer ring being severed from the inner ring in one segment of the top and the top having an unweakened area opposite the severed segment which connects the outer ring to the rest of the closure for lifting the closure from the bottle.

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**3,672,528**

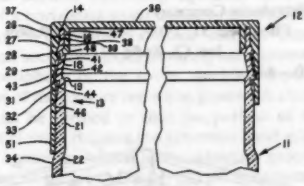
**NECK FOR WIDE-MOUTH JAR AND CAP THEREFOR**

**George W. Faulstich, c/o Cap Snap Seal, Inc., 800 Alameda Street, San Carlos, Calif.**

**Continuation-in-part of Ser. No. 24,708, April 1, 1970. This application Dec. 18, 1970, Ser. No. 99,607**

**Int. Cl. B65d 41/32**

**U.S. Cl. 215—46 A** **10 Claims**



A wide-mouth jar of plastic or glass has an exterior neck finish comprising two circumferential, vertically spaced buttressed beads, the lower being of greater diameter than the upper. The plastic cap which fits on the neck has a flat-top disk with a peripheral skirt, the interior of which is formed with two circumferential beads dimensioned to engage immediately under the radial flanks of the beads of the neck. The wall of the skirt is weakened immediately above the lower cap bead in a circumferential internal groove which connects with two downward slanted internal grooves extending to the bottom of the skirt. A first finger grip tab depends from the bot-

tom of the skirt to one side of the slanted groove to tear the cap along the grooves. A second tab depends from the bottom of the skirt between the downward slanted grooves to pry the cap off the neck.

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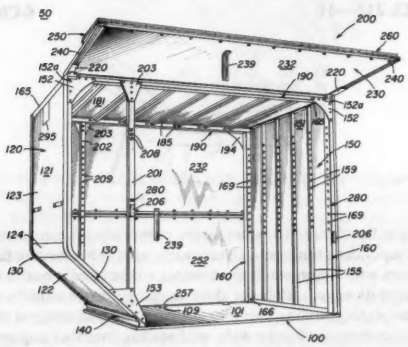
**3,672,529**

**CARGO CONTAINER**

**Donald W. Feddersen, Northbrook, and Everett L. Markowski, Morton Grove, both of Ill., assignors to Air Cargo Equipment Corporation, Tulsa, Okla.**

**Filed Nov. 14, 1969, Ser. No. 876,654**
**Int. Cl. B65d** *87/00*
**U.S. Cl. 220—1.5** **38 Claims**



A container for transporting goods by airplane comprises a top wall, a bottom wall, and a pair of opposed side walls all bounded by rigid framework and cooperating to define a pair of openings which are respectively closed by stowable door structures, each of the door structures including a pair of door brackets pivotally mounted on the top wall framework and two hingedly interconnected door panels one of which is slidably mounted on the door brackets, the door structures being movable between a closed position completely closing the openings and a stowed position folded atop the container, and two latch assemblies on each door structure for holding it in the closed position; adjustable shelves are mounted on the framework within the container.

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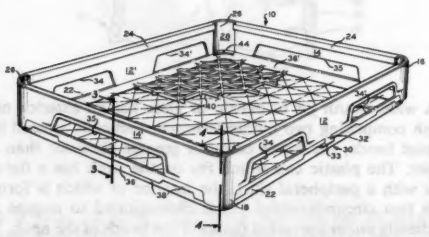
**3,672,530**

**TRAY COLLAR AND TRAY-COLLAR COMBINATIONS**

**Orville J. Bridenstine, Wayzata, Minn.; Melvin S. Shutt, and Harry A. Brookshire, both of Bartlesville, Okla., assignors to Phillips Petroleum Company**

**Filed Dec. 31, 1969, Ser. No. 889,669**
**Int. Cl. B65d** *11/10*
**U.S. Cl. 220—4 R** **23 Claims**



A collar adapted to extend the height of the walls of a pallet tray when placed on said pallet tray. Said collar is provided with means to engage the walls of the tray and means for securing the collar to the tray. Combinations of said tray and said collar are also disclosed.

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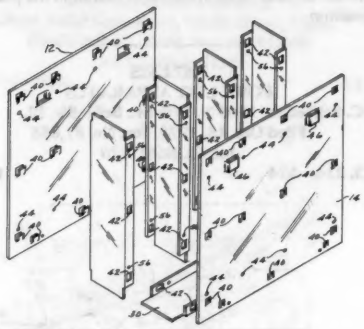
**3,672,531**

**RECEPTACLE**

**Martin H. Balven, Florissant, Mo., assignor to Emerson Electric Co., St. Louis, Mo.**

**Filed March 2, 1970, Ser. No. 15,508**
**Int. Cl. B65d** *7/24, 25/04, 25/22*
**U.S. Cl. 220—4 R** **18 Claims**



A receptacle for holding objects such as welding rods is disclosed which includes side walls, a bottom wall and partitions defining a box having a plurality of compartments, the walls and partitions being separate members which consist of two different kinds of parts. The members are provided with interfitting slots and tabs so that the members can be readily assembled into the form of a box and disassembled as desired, and without the necessity of screws or bolts and nuts.

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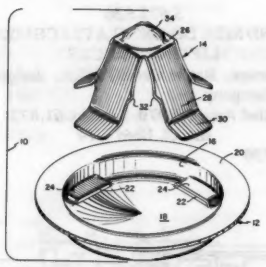
**3,672,532**

**HIGH TOLERANCE HOLE-PLUG FOR SHEET METAL**

**Phillip D. Becker, Southbury, Conn., assignor to Buell Industries, Incorporated, Waterbury, Conn.**

**Filed April 14, 1971, Ser. No. 133,851**
**Int. Cl. B65d** *45/00*
**U.S. Cl. 220—25** **13 Claims**



The invention pertains to a hole-plug for closing an access aperture in a sheet or plate-like support member. An externally flanged cup configured to be loosely received in the aperture, with the flange overlying the margin thereof, is clamped to the support member by a malleable metal spider positioned within and crosswise of the bottom of the cup. Initially the mid-portion of the spider is arched centrally outwardly from the cup bottom, and the legs of the spider are reversely arched with the tips disposed in registering slots formed in the cup wall. Flattening the arched mid-portion of

the spider toward the bottom wall of the cup when the plug is placed in the hole to be closed causes the legs of the spider to expand radially outwardly and their tips to curl back into clamping engagement with the opposite surface of the support member engaged by the peripheral flange of the cup.

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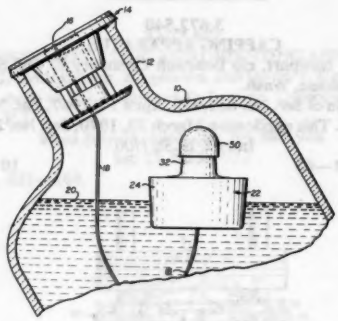
**3,672,533**

**FLOATING VENT DEVICE**

**Jack H. McKean, Mission, Kans., assignor to Chemagro Corporation, Kansas City, Mo.**

**Filed Dec. 3, 1970, Ser. No. 94,701**
**Int. Cl. B65d *51/16***
**U.S. Cl. 220—44 R** **8 Claims**



The invention is a floating vent device comprising a pair of members together defining a chamber, a gas permeable porous carbon body subdividing said chamber into two zones of which a first is provided with at least one aperture; a float connected with said pair of members so as to permit them to float above a body of liquid, and a tube projecting axially through said float, through said first zone and in air-tight fashion through said carbon body into said second zone. The other end of the tube is connected to a closure for a container and communicates with the outside atmosphere through an orifice in the closure.

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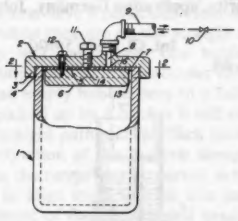
**3,672,534**

**CLOSURE FOR HIGH PRESSURE CHAMBER**

**John F. Brennan, Des Plaines, Ill., and Universal Oil Products Company, Des Plaines, Ill.**

**Filed June 19, 1970, Ser. No. 47,852**
**Int. Cl. B65d *53/00***
**U.S. Cl. 220—46 P** **4 Claims**



A closure system for a high pressure chamber which is particularly designed to permit the use of an interior glass coating or other non-metallic liner material. The closure design includes a demountable cover for a chamber opening, a gasket member which will extend around the interior periphery of the opening, and an inner "piston" member, which will assist in providing a sealing of the gasket member around the chamber opening. A release bolt provides for pushing inwardly against the inner piston member so as to let fluid pressure into or out of the chamber from a port located centrally in the cover member at a zone opposed by the piston member.

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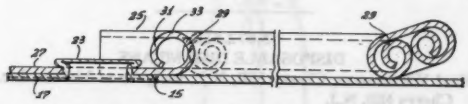
**3,672,535**

**RING TAB FOR EASY-OPEN CAN**

**J. B. McGuire, Palos Verdes Peninsula, Calif., assignor to Ermal C. Fraze, Dayton, Ohio**

**Filed Dec. 18, 1970, Ser. No. 99,603**
**Int. Cl. B65d *17/24***
**U.S. Cl. 220—54** **10 Claims**



A tab for use with an easy-open can end in which the attachment portion of the tab is formed integral with the inner tab bead and is passed below the outer tab bead and extends to a position beyond the outer periphery of the outer bead for attachment to a tear strip by suitable means such as an integral rivet. The attachment portion is sufficiently long to prevent a sharp bending of the tear strip in the area immediately adjacent the rivet.

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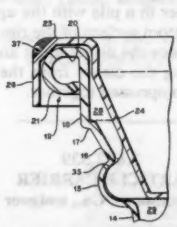
**3,672,536**

**CONTAINER AND CLOSURE THEREFOR**

**Alfred W. Kinney, Kansas City, Mo., and James W. Williams, Bartlesville, Okla., assignors to Phillips Petroleum Company**

**Filed Feb. 5, 1970, Ser. No. 8,981**
**Int. Cl. B65d *43/10, 21/02, 51/16***
**U.S. Cl. 220—60 R** **8 Claims**



A container with a closure retention groove is provided with a rigid stacking ring structure of reduced height, comprising a vertical wall section extending upwardly from the outer periphery of a horizontal lower stacking shoulder to the inner periphery of a horizontal annular rim. A compressional camming wall section extends inwardly and downwardly from the inner periphery of the lower stacking shoulder to the upper extent of the closure retention groove. A closure for the container can be formed so that the portion of the closure between the closure rim and the retention bead grips the portion of the container between the retention groove and the container rim, to secure the closure to the container.

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**3,672,537**

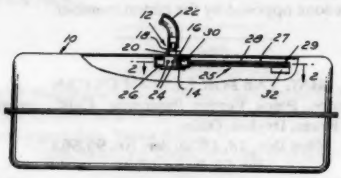
**FUEL TANK VAPOR SEPARATOR SYSTEM HAVING PIVOTING ARM VAPOR PICKUP**

**Ernest W. Kitzner, Allen Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Aug. 14, 1970, Ser. No. 63,873**
**Int. Cl. B65d *25/00***
**U.S. Cl. 220—85 VR** **5 Claims**

A hollow arm pivots in a plane substantially parallel to the fuel tank roof about a pivot member located in the center of the roof. Buoyant material attached to the outer end of the

arm urges that end to any vapor space existing above the liquid regardless of tank attitude. Excess fuel vapors pass



through the passage in the arm and are conducted to the engine combustion chambers.

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**3,672,538**

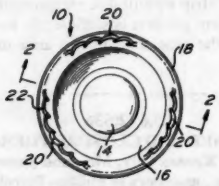
**DISPOSABLE DISH MEANS**

**Karl Wiedemann, Cherry Hill, N.J., assignor to Melitta, Inc., Cherry Hill, N.J.**

**Filed Sept. 25, 1970, Ser. No. 75,639**

**Int. Cl. B65d *21/02, 7/48***

**U.S. Cl. 220—97 C** **4 Claims**



A disposable dish, such as a plate, saucer or bowl, having a rim around the edge of a central portion. The rim has a plurality of spaced upstanding ribs thereon. The dishes are adapted to be stacked together in a pile with the upper surface of the ribs engaging the bottom surface of the rim of the next uppermost dish so as to space the dishes apart and allow for ease of individually removing the dishes from the stack even if the stack of dishes are compressed together.

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**3,672,539**

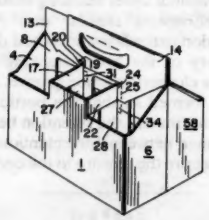
**ARTICLE CARRIER**

**Homer W. Forrer, Jonesboro, Ga., assignor to The Mead Corporation**

**Filed Dec. 3, 1969, Ser. No. 881,668**

**Int. Cl. B65d *75/00***

**U.S. Cl. 220—113** **10 Claims**



A basket style article carrier having full depth partition structure is formed from a single unitary blank. A partition element comprises a partition strip foldably joined to one side wall and to a handle panel through a relief tab arranged to render the partition strip extensible, and a transverse partition panel struck from longitudinal partition structure is adjoined thereto by a partition relief tab so that the effective length of the partition strip may be increased so as to afford hand gripping space adjacent the handle of the carrier. The longitudinal partition structure is arranged to extend to the bottom wall of the carrier and access to a locking tab disposed adjacent the bottom edge of the longitudinal partition structure is afforded by means of a hinge line adjoining the lowermost portion of the longitudinal partition structure to the upper part thereof so that when the carrier is set up the bottom wall engages and brushes to one side the lowermost portion of the longitudinal partition structure thereby to expose the locking notch for engagement by the end edge of the bottom wall. The carrier is strengthened by means of a medial partition panel which is struck from the pair of medial panels which form the longitudinal partition structure and folded downwardly along a diagonal fold line and is secured to an auxiliary reinforcing panel struck from one of the handle panels and folded downwardly into flat face contacting relationship to the medial partition.

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**3,672,540**

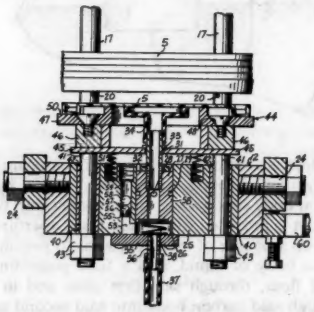
**CAPPING APPARATUS**

**Richard A. Newport, c/o Benewah Creamery E. 408 Sprague Ave., Spokane, Wash.**

**Division of Ser. No. 631,033, April 14, 1967, Pat. No. 3,511,025. This application March 20, 1970, Ser. No. 21,258**

**Int. Cl. B65h *1/00***

**U.S. Cl. 221—63** **10 Claims**



An apparatus for applying closures to receptacles, particularly designed for applying caps to cylindrical cartons. A vacuum device receives the caps from a magazine and places each cap on a carton centered by a conveying and positioning apparatus.

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**3,672,541**

**FEEDING DEVICE FOR CIGARETTES FOR CIGARETTE PACKING MACHINES**

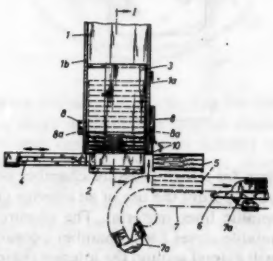
**Otto Niepmann, Gevelsberg, Germany, assignor to Maschinenfabrik Fr. Niepmann & Co., Gevelsberg, Germany**

**Filed July 1, 1969, Ser. No. 838,253**

**Claims priority, application Germany, July 2, 1968, P 17 57 970.3**

**Int. Cl. B65g *59/00***

**U.S. Cl. 221—68** **5 Claims**



An apparatus in which cigarettes are ejected in batches in an endwise direction from chutes in which the cigarettes are

disposed in vertical stacks. To permit high speed of operation, the cigarettes are urged downwardly in the chutes by air jets so that following the ejection of a batch of cigarettes from the chutes, the next batch to be ejected will move quickly into ejection position. To prevent tilting of the cigarettes in the chutes, the ends of the cigarettes next to drop into ejection position are engaged by a stop member until the ejecting member is withdrawn from beneath the cigarettes, whereupon the stop member is withdrawn and the cigarettes dropped to ejection position while remaining horizontal. The supply of compressed air to the nozzles is preferably regulated so as to take place at about the instant the cigarettes are to drop to ejection position.

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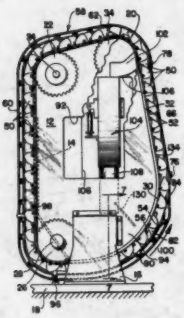
**3,672,542**

## BOBBIN SEGREGATING AND ORIENTING APPARATUS

David G. Cruickshank, Kingstown, and David T. Guerin, Warwick, both of R.I., assignors to Leesona Corporation, Warwick, R.I.

Filed July 18, 1969, Ser. No. 842,948
Int. Cl. B23q 7/12
U.S. Cl. 221—161 21 Claims



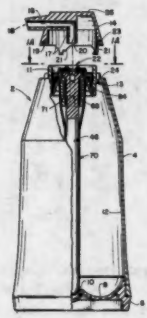
Apparatus for segregating a jumbled mass of bobbins and delivery of the bobbins one at a time in axial orientation. A chain conveyor includes a plurality of buckets for receiving bobbins. These buckets open inwardly and together form the bottom of a hopper which receives the jumbled bobbins. As the conveyor is driven, a bucket receives a bobbin from the hopper and carries the bobbin upwardly along a substantially straight path to a discharge chute at an upper portion of the apparatus. The buckets have a particular cross-sectional configuration so that when they are on the straight upwardly extending path they will retain only one bobbin having a rounded cross-section and within a particular range of diameters varying from an empty bobbin core to a full bobbin. If a second bobbin is picked up by a bucket it will drop from the bucket along the straight path and fall back into the hopper. By varying the inclination of the buckets along the straight portion of the path, the range may be varied. A bobbin in the hopper may tend to align itself with its axis parallel to the direction of movement of the buckets and would thus block the buckets from receiving bobbins having their axes transverse to the path of movement of the buckets. Such a parallel bobbin is flipped over so that it falls back onto the hopper with its axis transverse to the path of movement of the buckets. Bobbins are fed into the hopper responsive to a reduction in weight of the bobbins in the hopper and the hopper is driven intermittently to deliver bobbins one at a time responsive to an external demand.

**3,672,543**

## FLOWABLE SUBSTANCES DISPENSER

William H. Roper, Los Angeles; Robert N. Ross, Fountain Valley, and Gabor Visnovits, Anaheim, all of Calif., assignors to Plant Industries, Inc., Anaheim, Calif.

Filed Feb. 11, 1971, Ser. No. 114,427
Int. Cl. B67d 5/06
U.S. Cl. 222—183 11 Claims



In a fluid dispenser of the expansible member or bladder type wherein the memory of the material furnishes the dispensing force, a unitary mandrel and valve closure member acts to pretension the expansible member and to act as the valve closure, the axial movement of which permits the fluid contained within the expansible member to be dispensed.

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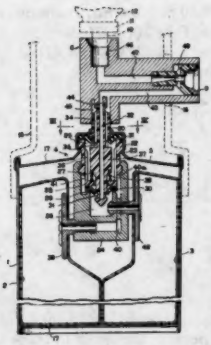
**3,672,544**

## MULTI-COMPONENT PRODUCT DISPENSER

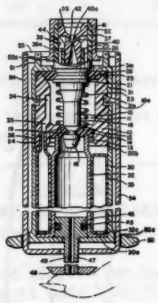
Jean Marand, Norwalk, Conn., assignor to Ciba-Geigy Corporation

Filed June 22, 1970, Ser. No. 48,336
Int. Cl. B65d 83/14
U.S. Cl. 222—94 26 Claims



A dispenser for spraying a multi-component product includes a product container housing the product components. The components are mutually isolated and are put in communication with product passages through a valve of the container. The stem of the valve is connected to a coupler-aspirator. An aerosol propellant cartridge is also connected to the coupler-aspirator. When the propellant cartridge is depressed, both the valve thereof and the container valve are opened. The product components are then combined and aspirated by the propellant through the coupler-aspirator.

**3,672,545**
**AIR PRESSURE OPERATED DISPENSER**
**Jean Marand, Norwalk, Conn., assignor to Ciba-Geigy Corporation**
**Filed June 9, 1970, Ser. No. 44,694**
**Int. Cl. B67d** *5/54*
**U.S. Cl. 222—193** **8 Claims**



A dispensing device in which the product to be dispensed is aspirated and sprayed by the discharged pressurized air. A valve assembly has a product flow path therethrough and a compressed air flow path therethrough. The valve stem of the assembly is actuated to open the flow paths, and aspirating means is provided at the upper end of said stem for bringing one end of each of said flow paths together. A piston-cylinder assembly is provided on the device having a cylinder with one end around the end of the compressed air flow path, a piston slidable in the cylinder, and a piston rod on said piston and extending out of the other end of said cylinder. A product containing sac has a neck thereon sealed around the end of the product flow path. An actuator means is connected between the piston rod and the valve assembly for moving the valve stem relative to the valve body for opening the flow paths when the piston is moved to the inner end of the cylinder adjacent the valve assembly to provide a predetermined amount of compressed air.

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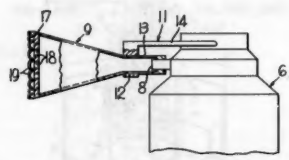
**3,672,546**
**FOAM DISPENSING HEAD**
**Emil T. Ruhle, 7050 S. 92nd St., Franklin, Wis.**
**Filed Feb. 20, 1970, Ser. No. 12,926**
**Int. Cl. B65d** *83/14*
**U.S. Cl. 222—402.12** **1 Claim**




A foam dispensing head for attachment to a pressurized container. The spout is a diffuser which decreases the velocity of the foam and permits the spout to be placed directly against the surface on which the foam is to be applied.

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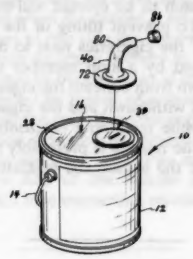
**3,672,547**
**CONTAINER WITH REPLACEABLE PLUG AND POURING SPOUT**
**Robert L. Kozlowski, 29989 Woodhaven Lane, Southfield, Mich.**
**Filed Dec. 30, 1969, Ser. No. 889,169**
**Int. Cl. B65d** *25/48*
**U.S. Cl. 222—567** **3 Claims**

A lid for a paint can and the like, the lid having a circular aperture formed therein adjacent one edge. A removable plug is provided for closing the aperture formed in the lid. When it is desired to pour material from the container, the plug is removed from the aperture in the lid and a pouring agent is placed over the aperture.

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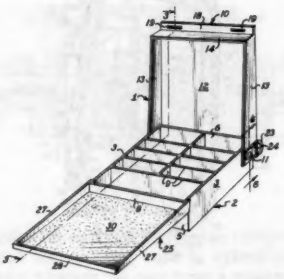
**3,672,548**
**TACKLE BOX**
**Gus H. Mavrakis, 135 Burlington Ave., Billings, Mont.**
**Filed April 5, 1971, Ser. No. 131,038**
**Int. Cl. A45c** *11/00*
**U.S. Cl. 224—5 G** **6 Claims**



An improved tackle box adapted to be supported on the front of the user by means of shoulder straps is disclosed. The tackle box comprises three basic component parts. These include (1) a receptacle having a number of partitioning walls (2) a support member in the form of an outer cover for said receptacle and (3) a combined shelf and supplemental cover for said receptacle. The front wall of the receptacle includes a forwardly extending offset position that cooperates with the side and front wall of the shelf to provide a tray having continuous, upstanding side walls. The offset portion of the front wall of the receptacle also serves as stop means for limiting the pivotal travel of the shelf. The tackle box is sturdy and durable in construction, yet is relatively simple and easy to manufacture.

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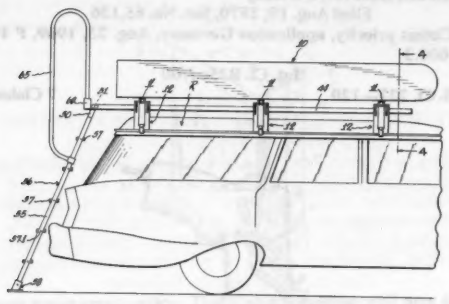
**3,672,549**
**CAR TOP CARRIER AND ACCESS LADDER**
**Andro J. Chorey, 8315 Gibson Road, Canfield, Ohio**
**Filed Dec. 15, 1969, Ser. No. 884,882**
**Int. Cl. B60r** *3/00, 9/04*
**U.S. Cl. 224—42.1 E** **4 Claims**

A car top rack and an access ladder assembly is herein disclosed. The rack is removably mounted on the roof of the car by bracket supports which provide for adjustment to conform to the contour of the car roof and to provide for leveling of the carrier. The ladder forms part of the structure and may be stored between rails which extend longitudinally of the car, for

transportation purposes. The access ladder may be easily moved from its stored position to a position wherein it extends



downwardly from the rear portion of the car top rack, with its lowerend engaging the ground, whereby ready access to the carrier, and the material supported thereby, is effected.

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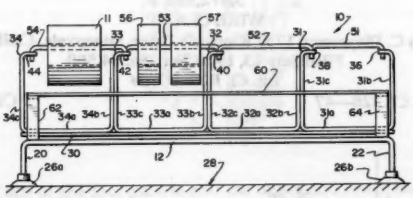
**3,672,550**
**MULTI-TAPE DISPENSER**
**Michael R. Greco, 5005 W. Belden, Chicago, Ill.**
**Filed July 7, 1969, Ser. No. 839,184**
**Int. Cl. B65h *35/10*; A47k *10/32***
**U.S. Cl. 225—34** **14 Claims**



A tape dispenser including a supporting framework having at least one open space defined between two plate portions which support a rod member mounting at least one roll of tape. Each of the plate portions has at least one aperture therein and the rod member is C-shaped having a middle portion and two end portions which extend transversely of the middle portion and which are releasably received and firmly held in the apertures.

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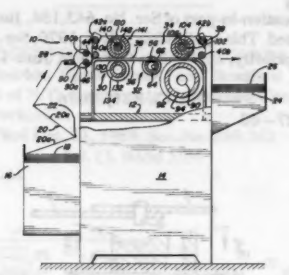
**3,672,551**
**BURSTER WITH INTERRUPTED DRIVE**
**Charles L. Peterson, Crystal Lake, Ill., assignor to Uarco Incorporated**
**Filed Nov. 4, 1970, Ser. No. 86,731**
**Int. Cl. B65h *35/10***
**U.S. Cl. 225—100** **6 Claims**

An improved burster for separating continuous form stationery along transverse lines of weakening wherein the infeed and outfeed rollers are maintained a fixed distance apart, with the outfeed rollers being driven at a faster rate of speed than the infeed rollers. A limited lost motion connection is interposed in the drive to the infeed rollers to allow the infeed rollers to establish an idler relationship relative to the outfeed rollers when the stationery strip is gripped between both sets of rollers so that the infeed rollers rotate at a rate of speed which approaches that of the outfeed rollers. When the limit of the lost motion idler relationship is established the speed of



the infeed rollers is rapidly reduced, causing severance of the strip of stationery along the transverse line of weakening.

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**ERRATUM**

For Class 226—108 see:
Patent No. 3,672,655

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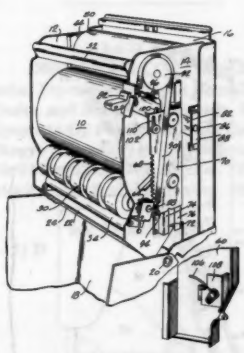
**3,672,552**
**DISPENSER FOR WEB OF PERFORATED TOWELING SHEETS**
**Archie S. Krueger, and Norman J. Slye, both of Green Bay, Wis., assignors to Alwin Manufacturing Company, Inc., Green Bay, Wis.**
**Filed Feb. 3, 1970, Ser. No. 8,235**
**Int. Cl. A47k *10/38*; B65h *17/22***
**U.S. Cl. 226—129** **8 Claims**



A hard rolled web of paper toweling or the like has spaced transverse rows of perforations defining separate sheets. A dispenser for advancing the web from its storage cabinet comprises a lever which does not directly actuate the web but stores energy in a spring. After predetermined handle movement, a trip releases the spring for actuation of a feed roll to eject a precisely predetermined length of web. When a new roll is inserted, the remaining end of the old roll is ejected along with corresponding components of the new roll, it being found that this disposition of the remainder of the original web satisfies consumers by temporarily supplying multiple plies, thus using such a remainder to good advantage by tending to prevent consumers from re-cycling the lever and spring to withdraw a second length of toweling.

3,672,553

## APPARATUS TO PRODUCE A RIVETED CONNECTION

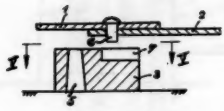
Erich Doring, Thalbachstra 8, Moosburg, Upper Bavaria, Germany

Continuation-in-part of Ser. No. 643,154, June 2, 1967, abandoned. This application July 6, 1970, Ser. No. 52,414

Claims priority, application Germany, June 15, 1966, D 50 326

Int. Cl. B21J 15/36

U.S. Cl. 227—62 6 Claims



An apparatus wherein a riveted connection is formed between two strips. A rivet is held in an upper die member or dolly directly above a lower die member having an opening therein. Superposed strips are positioned adjacent the lower die member covering the opening therein. Relative movement between the die members causes the body of the rivet to punch a hole through the superposed strips. The extending end of the rivet body is then deformed to form a closure head portion whereby the strips are rigidly connected.

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3,672,554

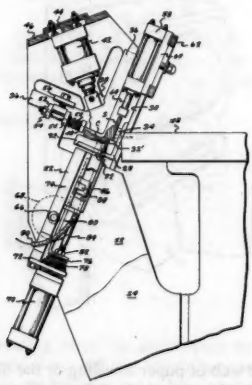
## MEANS FOR SECURING DOOR FRAME COMPONENTS

Roy E. Smith, Atlanta, Ga., assignor to Textron, Inc., Providence, R.I.

Filed Dec. 28, 1970, Ser. No. 102,035

Int. Cl. B25c 7/00; B27f 7/02

U.S. Cl. 227—93 9 Claims



Apparatus is provided for securing a door frame casing piece to a side jamb rapidly and effectively. The apparatus operates to hold the casing piece and side jamb in door frame relation while causing the side jamb to be toenailed to the casing piece and the casing piece to be square nailed to the side jamb. The nailing is done by respective fastener forming and inserting means, at least one of which is uniquely arranged to actuate feeding of a fastener length of wire stock, forming of a fastener from the fed length, and insertion of the formed fastener, from the working stroke of a reciprocating plunger.

3,672,555

## NAILING TOOL

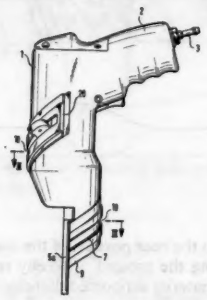
Jurgen Korth, Berenbostel, Germany, assignor to Bukama GmbH, Hanover, Germany

Filed Aug. 19, 1970, Ser. No. 65,136

Claims priority, application Germany, Aug. 23, 1969, P 19 43 000.3

Int. Cl. B25c 1/00

U.S. Cl. 227—120 7 Claims



In a portable pneumatic fastener driving device a magazine which receives fasteners joined in a strip is arranged helically around the tool body. The outer wall of the magazine is provided with a longitudinal slot for guiding a spring-loaded slide which effects the feed of the fasteners towards the drive track. The slot is covered by a coil spring wound on a reel which is attached to the slide.

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3,672,556

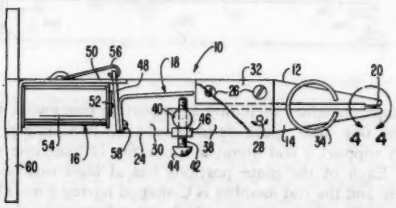
## WIRE CLAMP

John C. Diepeveen, 1737 Kimberly Drive, Sunnyvale, Calif.

Filed July 13, 1970, Ser. No. 54,500

Int. Cl. B23k 37/04

U.S. Cl. 228—47 9 Claims




An improved wire clamp for use with a wire-bonding machine to sever wires of the order of 1 to 10 mils wherein the wire clamp includes a pair of relatively shiftable jaws, a power device, and spring means for effecting relative movement of the jaws when the power device is actuated. The tension of the spring means can be adjusted to vary the pressure exerted on a wire between the jaws. The clamp has means thereon for attaching the same to a wire-bonding machine.

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3,672,557

## CARTON WITH PULL-SPOUT WALL CONSTRUCTION

Robert A. Krzyzanowski, Milwaukee, Wis., assignor to Milprint, Inc., Milwaukee, Wis.

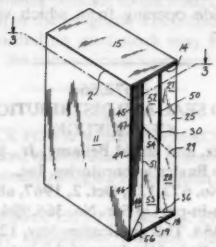
Filed March 2, 1970, Ser. No. 15,610

Int. Cl. B65d 5/72, 5/54

U.S. Cl. 229—17 R 3 Claims

A carton, and a blank therefor, with one wall constructed of two panels hinged together along a central or axial fold line to

form a V-shaped infolded carton wall having a transverse fold line about which a portion of the wall can be hinged to form a



pour spout construction. The V-shaped carton wall may also have a pull tab to facilitate actuation of the spout construction.

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**3,672,558**

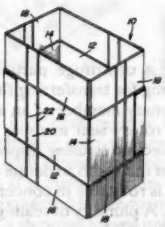
**ADJUSTABLE CORRUGATED SHIPPING CONTAINER AND/OR ADJUSTABLE CARDBOARD SHIPPING CARTON**

**Bernard G. Johnson, 232 Cedar St., Neenah, Wis.**

**Filed Feb. 3, 1970, Ser. No. 8,368**

**Int. Cl. B65d *5/08***

**U.S. Cl. 229—37 R** **1 Claim**



Each of the four panels, and the upper and lower flaps associated therewith, of a shipping carton incorporate a full height foldable section which enables a selective reduction in the length and/or width of the carton, in conjunction with an increase in the rigidity of the carton and without affecting the ability of the flaps to close and seal the opposed ends of the carton.

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**3,672,559**

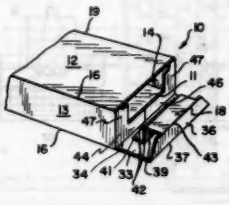
**CARTON WITH PRODUCT HOLDING FEATURE**

**George P. Webinger, Minneapolis, Minn., assignor to Container Corporation of America, Chicago, Ill.**

**Filed May 22, 1970, Ser. No. 39,830**

**Int. Cl. B65d *5/10***

**U.S. Cl. 229—39 R** **1 Claim**



A carton having a tuck flap so-constructed and arranged as to engage a surface of a product and hold same in position. A carton sleeve has a closure flap with extensions therefrom, these being folded and secured into position to define a structure engageable with the said surface.

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**3,672,560**

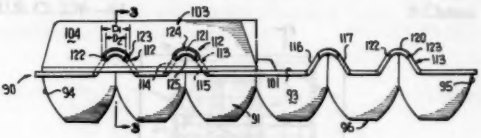
**LOCKS FOR EGG CARTON COVERS**

**Harold W. Voorhis, Upper Nyack, and Bradford Post, West Nyack, both of N.Y., assignors to Continental Can Company, Inc., New York, N.Y.**

**Filed Dec. 31, 1969, Ser. No. 889,361**

**Int. Cl. B65d *5/66***

**U.S. Cl. 229—44** **4 Claims**



This disclosure relates to one-piece molded plastic egg cartons in which a cover is hingeably connected to a carton body, and side walls of the cover and carton body remote from the hinge means are provided with interlocking means for maintaining the cover in its closed position. The interlocking means are defined by posts which project above the terminal edge of the carton body and are interlockably received within recess means or openings of the carton side wall. The posts and covers are preferably constructed from flexible and reboundable material to permit temporary deformation incident to the opening and closing of the carton.

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**ERRATUM**

For Class 229—44 R see:
Patent No. 3,672,693

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**3,672,561**

**DISPENSING CONTAINER**

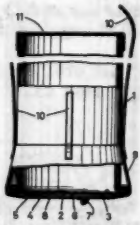
**Junzo Sakamoto, Toyonaka; Tadashi Nozaki, Kyoto; Yoshifumi Tsuji, Osaka, and Masaharu Shimada, Hamamatsu, all of Japan, assignors to Oji Paper Co., Ltd.; Daido Yoshiten Ltd. and Taiyo Kogyo Company Limited, Tokyo, Japan**

**Filed March 22, 1971, Ser. No. 126,644**

**Claims priority, application Japan, March 23, 1970, 45/27802**

**Int. Cl. B65d *5/70***

**U.S. Cl. 229—51 D** **3 Claims**



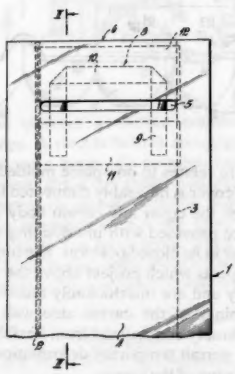
This invention relates to a reinforced disposable container which comprises a cylinder of paper, plastic, metal, canvas or plastic-coated metal sheet with panels at opposite ends, the panel at one end having an opening with closure means. A fabric reinforcement surrounds at least a part of the cylinder

and the panel at the one end with an opening therein coextensive with the opening in the panel to permit removal of the closure and dispensing of the contents in the container.

### 3,672,562
### CARRYING BAG OF PLASTICS MATERIAL SHEETING

Frank Bosse, 453 Ibbenburen-Dorenthe, Am Wasserwerk 24, Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed July 9, 1970, Ser. No. 53,373
Claims priority, application Germany, July 15, 1969, P 19 35 987.6
Int. Cl. B65d 33/10
U.S. Cl. 229—54 C 7 Claims

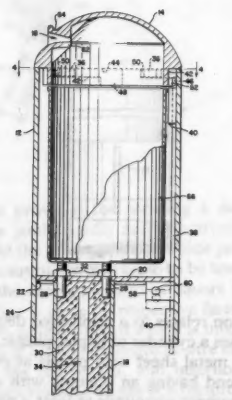


A known carrying handle consisting of a flat strip of plastics material folded to a U-shaped configuration is secured at its leg end portions to one wall of the bag at such a distance below the open rim of the bag that the central portion of the handle does not protrude beyond the open rim of the bag when the latter is flattened. The other wall of the bag is formed with a lead-out slot in that area which is in register with the unattached portions of the leg of the handle. The lead-out slot is parallel to the open rim of the bag and has a length which is approximately as large as the width of the carrying handle.

### 3,672,563
### VALUABLES DEPOSITORY

Jack A. McMath, Ft. Thomas, Ky., assignor to Dover Corporation, Cincinnati, Ohio

Filed Oct. 14, 1970, Ser. No. 80,539
Int. Cl. E05g 1/04
U.S. Cl. 232—1 R 5 Claims

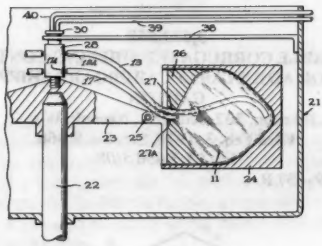


A valuables depository for receiving and storing valuables such as money or the like is disclosed. The valuables depository provides a non-accessible receptable into which the valuables are placed. A lock means is provided to prevent theft of the valuables from the depository. Closure means are also provided so that the depository may be left unattended wherein there is no outside opening from which valuables may be removed or stolen.

### 3,672,564
### ROTARY FLUID SEAL AND DISTRIBUTION MEANS FOR CENTRIFUGES

Charles A. Schlutz, and David Bellamy, Jr., both of Glenview, Ill., assignors to Baxter Laboratories, Inc.

Division of Ser. No. 672,125, Oct. 2, 1967, abandoned, which is a continuation-in-part of Ser. No. 366,994, May 13, 1964, Pat. No. 3,347,454. This application Nov. 12, 1969, Ser. No. 871,242. The portion of the term of this patent subsequent to Oct. 17, 1984, has been disclaimed.
Int. Cl. B04b 9/12
U.S. Cl. 233—26 4 Claims

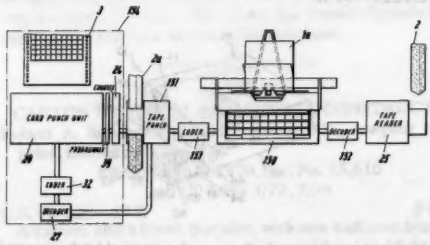


A rotary seal for a centrifuge particularly usable in the process of cell washing for transferring fluid between a rotary member and a stationary member of an apparatus adapted to contain fluids. The rotary seal member comprises a hollow first housing, and a second housing disposed in the first housing in spaced relation therewith to define an annular chamber. One of the housings is rotatable in concentric relation relative to the other housing. A plurality of sealing means are transversely mounted between the first and second housings to divide the annular chamber into several separate sealed portions, and conduits lead from the exterior of both the first and second housings to separate sealed portions of the annular chamber.

### 3,672,565
### PUNCHED TAPE CONTROLLED CARD PUNCHER

Gerhard Ritzerfeld, Schorlemer Allee 14, Berlin-Dahlem, Germany

Division of Ser. No. 842,958, June 18, 1969, Pat. No. 3,630,433. This application Jan. 26, 1971, Ser. No. 109,810
Claims priority, application Germany, July 19, 1969, P 17 74 580.1
Int. Cl. G06k 1/18, 1/22
U.S. Cl. 234—36 9 Claims




A card punching arrangement in which information stored on punched tape is transferred to lines of a card punched by a

card puncher. Signals from a tape reader are applied to a coding circuit for translating the code from the tape into a code suitable for recording on the card. A counter with forward and reverse counting features is connected to a card puncher by way of a programmable selector in the form of a plug board to facilitate variation in the program. The information stored on the tape and recorded on card stock may include all of the symbols found on the conventional keyboard of a typewriter.

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**3,672,566**

## DEVICE FOR A BUSINESS MACHINE

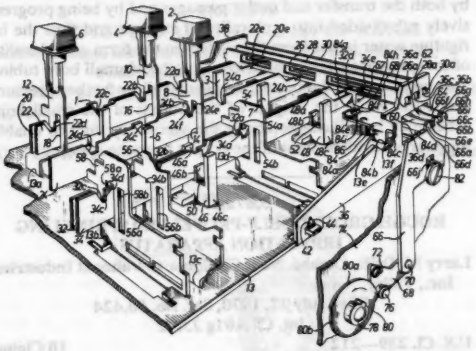
**Mats Erik Mattsson, Sollentuna, and Claes-Goran Lindelow, Taby, both of Sweden, assignors to Svenska Dataregister AB, Solna, Sweden**

**Filed March 13, 1970, Ser. No. 19,409**

**Claims priority, application Sweden, March 20, 1969, 3868/69**

**Int. Cl. G06c *25/00***

**U.S. Cl. 235—60.49** **8 Claims**



A memory device in a cash register keyboard including resilient means cooperating with memory slides to prevent setting of these slides until a machine cycle initiating key is entirely depressed. This is accomplished by the resilient means (leaf springs) being connected to the memory slide and being forced to bear against a stopping means until said key is entirely depressed. The stopping means is withdrawn from the moving path of the springs by starting the machine. By this arrangement, it is impossible to enter incorrect information in the cash register by displacing memory slides before a machine cycle has been started.

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**3,672,567**

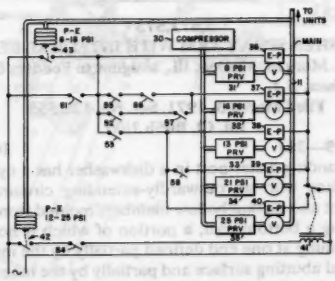
## MULTI-UNIT PNEUMATIC CONTROL SYSTEM

**Frederick D. Joesting, Park Ridge, Ill., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Oct. 19, 1970, Ser. No. 82,034**

**Int. Cl. G05d *23/00***

**U.S. Cl. 236—1 C** **17 Claims**



A pneumatic unit ventilator control system utilizing a diaphragm logic memory circuit for winter-summer changing over to allow the running of a single main from the pressure source to the units. Depending upon the magnitude of the main pressure input to the memory circuit, and upon previous alterations of the main pressure, either summer or winter control will be achieved. Recycling means are included in the system to assure the return of the system to the desired mode of operation after a fluid pressure failure or a changeover from one mode of operation to another.

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**3,672,568**

## HUMIDIFIER

**Allen M. Foote, Box 1610, Hendersonville, N.C.**

**Filed Aug. 12, 1970, Ser. No. 63,483**

**Int. Cl. G05d *22/02***

**U.S. Cl. 236—44** **9 Claims**

A humidifier including a water receptacle, and an electric heating unit extending across the open top of the water receptacle with a flat wick hung over the electric heater and having the ends thereof disposed in the water to cause water to become engaged and evaporated by the heating unit due to capillary action. A portion of the heating unit is left exposed to produce thermo-convection current which forces moisture to rise. The humidifier is adapted for general utility but is especially constructed for use in musical instruments such as pianos or the like having an enlarged cabinet-like structure which enables the humidifier to be mounted directly in the interior of the cabinet-like structure for maintaining proper humidity conditions therein when combined with a humidistat and dehumidifier.

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**3,672,569**

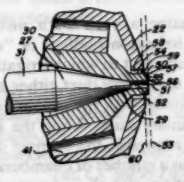
## ELECTROSTATIC SPRAY GUN NOZZLE AND AIR CAP

**Robert G. Smead, St. Charles, and Louis J. Bentsen, Arlington Heights, both of Ill., assignors to Graco Inc., Minneapolis, Minn.**

**Filed July 16, 1970, Ser. No. 55,539**

**Int. Cl. B05b *5/02***

**U.S. Cl. 239—15** **12 Claims**



In an electrostatic spray gun, the nozzle serves as the electrostatic charging electrode with a recessed forwardly facing

surface that joins a first sharp annular edge adjacent the coating material ejected from the nozzle and a second annular sharp edge adjacent the ejected atomizing air. An air cap surrounding the nozzle provides an annular parallel air ejection passage. Preferably, the sharp edges of the nozzle protrude slightly forwardly of the termination of the air ejection passage formed by the air cap.

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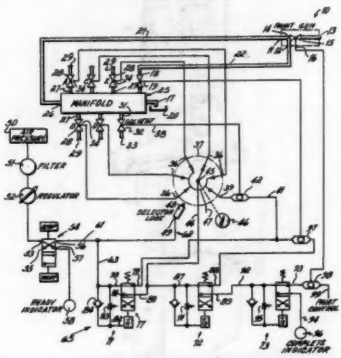
**3,672,570**

## SEQUENCE CONTROL OF COLOR CHANGE

**Don R. Scarbrough, Elyria, and Burton J. Vilagi, Amherst, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio**

**Filed Sept. 4, 1970, Ser. No. 69,662**
**Int. Cl. A01g *27/00***
**U.S. Cl. 239—70** **24 Claims**



A pneumatically controlled color change system for use with automatic multi-color paint spray apparatus and the like wherein an entirely pneumatically controlled system employing a pneumatic timer including pneumatic sequence valves controls a quick-color change system in which a plurality of colors of paint are connected to various inputs of a manifold, each through a check valve which isolates each of the manifold ports from each other and in which a source of solvent is connected to another input of the manifold. An exceedingly high-speed system is provided in which a metered charge of solvent only partially filling the system is injected through the manifold and forced through the system with the new color to be selected, thereby purging the system of the old color. High-speed valve timing is provided in the order of magnitude of 1 second per valve of the sequence.

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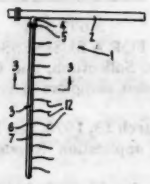
**3,672,571**

## TRICKLE IRRIGATION SYSTEM

**John Charles Goodricke, Launceston, Tasmania, Australia, assignor to A.C.I. Operations Proprietary Limited, Melbourne, Victoria, Australia**

**Filed Aug. 11, 1970, Ser. No. 62,797**
**Claims priority, application Australia, Aug. 11, 1969, 59322/69; Aug. 14, 1969, 63819/69**
**Int. Cl. A01g *27/00***
**U.S. Cl. 239—145** **10 Claims**

A system for irrigating a crop by a method commonly known as the trickle irrigation method or "drip" irrigation. The device has a primary duct to which irrigating water is supplied and at least one secondary duct either extending alongside in parallel relationship with the primary duct, or extending away from the primary duct. When the secondary ducts are situated to extend alongside the primary duct they are internally partitioned into a number of chambers. Each chamber is in fluid communication with the primary duct via at least one flow restricting transfer passage and is also provided with a plurality of flow restricting outlet passages. The number of outlet passages exceeds the number of transfer passages for a particular chamber. When the secondary ducts extend away from the primary duct the flow restricting transfer passage is provided in its connection to the primary duct and the secondary duct has a plurality of outlet passages. With the above systems the pressure of the irrigating water supplied is reduced



by both the transfer and outlet passages and by being progressively sub-divided into a plurality of streams and thus the irrigating water issues from the system in the form of a plurality of low pressure trickles or drips. Lengths of small bore tubing may be placed in the outlet passages to allow further pressure reduction while the heights of the outlets of the small bore tubes may be adjustable above the secondary duct to enable more precise adjustment of the output from the system.

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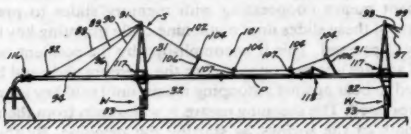
**3,672,572**

## ROUGH GROUND SELF-PROPELLED SPRINKLING IRRIGATION APPARATUS

**Larry M. Delfs, Omaha, Nebr., assignor to Valmont Industries, Inc., Valley, Nebr.**

**Filed July 27, 1970, Ser. No. 58,424**
**Int. Cl. A01g *25/02***
**U.S. Cl. 239—212** **10 Claims**



A self-propelled water sprinkling apparatus for irrigating a relatively large section of land wherein an elongated main water distributing pipe is revolved about one end as a pivot by a plurality of self-propelled support stations automatically maintained in alignment, with the apparatus capable of traveling over unduly irregular terrain or rough ground without inducing excessive stresses in the distributing pipe, the pivot or at the support towers by the introduction of flex joints in the distributing pipe at particular locations, and of a unique cable suspension arrangement for supporting the distributing pipe.

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**3,672,573**

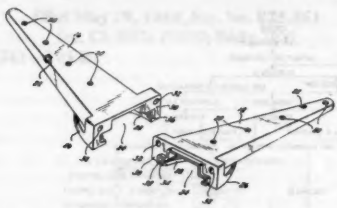
## DISHWASHER SPRAY ARM WITH INTEGRAL BEARING

**Wendell D. Morgan, Marion, Ill., assignor to Fedders Corporation, Edison, N.J.**

**Filed March 3, 1971, Ser. No. 120,555**
**Int. Cl. B05b *3/06***
**U.S. Cl. 239—261** **10 Claims**

An upstanding water post in a dishwasher has a cylindrical outer surface with an outwardly-extending circumferential flange. First and second hollow members molded from plastic, each having a bottom wall, a portion of which is horizontal, and an opening at one end defined partially by the inner edge of a vertical abutting surface and partially by the inner edge of a cylindrical surface formed in the horizontal portion of the bottom wall. The cylindrical surfaces of the first and second

members have a horizontal bearing slot formed therein, and the members are positioned so that the bearing slots receive the outwardly-extending flange of the water post to provide a



bearing for rotatably supporting the members. The first and second members are sealed together by a tongue and groove molded in the abutting surfaces of the respective members.

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**3,672,574**

**DEVICE FOR AERATING A JET OF WATER**

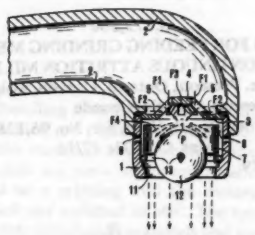
**Alfons Knapp, Bleicherstrasse 3, Biberach, Riss, Germany**

**Filed Sept. 29, 1970, Ser. No. 76,548**

**Claims priority, application Italy, July 20, 1970, 69486 A/70**

**Int. Cl. E03c *1/08***

**U.S. Cl. 239—428.5** **15 Claims**



A device for aerating a jet of water, wherein a subdivider member divides the water flow into a number of partial flows and directs said partial flows one against the other such as they impact violently and atomize one another within a chamber wherein exterior air may enter through openings of the body of the device for being absorbed in the atomized jet of water.

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**3,672,575**

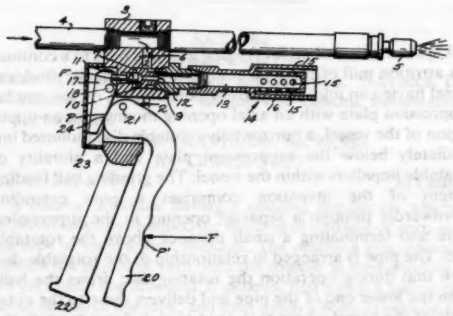
**HYDRO BLAST SAF-T-GUN**

**Jack F. Hinrichs, Missouri City, Tex., assignor to Hydro-Services, Inc., Missouri City, Tex.**

**Filed Feb. 1, 1971, Ser. No. 111,553**

**Int. Cl. B05b *15/00***

**U.S. Cl. 239—445** **5 Claims**



A high pressure water gun has a main conduit through which the high pressure water is directed which ends in a restricted nozzle for increasing the velocity of the water exiting therefrom. A cross-channel connects the main water conduit and a water dumping conduit which has a relatively low pressure outlet. The cross-channel has a floating valve positioned therein which is actuable between a seated and unseated position in a response to the movement of a pin valve. In turn, the pin valve is moved by a pivotably mounted lever under the influence of a force supplied by the cam surface of the handle lever.

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**3,672,576**

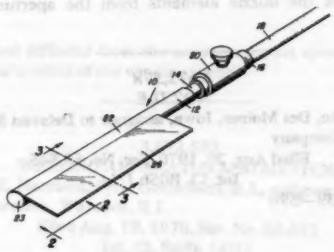
**BUTCHER'S PNEUMATIC BONE DUST VACUUM CLEANER**

**Leo J. Jefferson, and Lenard J. Crosby, both of Hollywood, Fla., assignors to Lenard J. Crosby and Harold E. Cook, Hollywood, Fla., part interest to each**

**Filed April 14, 1970, Ser. No. 28,385**

**Int. Cl. B05b *1/26***

**U.S. Cl. 239—521** **4 Claims**



This cleaner is a device for use by a butcher for vacuum cleaning bone dust off the surface of the meat and bone after he has used a saw to cut through the bone in the meat. It utilizes a vacuum created by pneumatic pressure from a conventional pneumatic pressure hose connected to any suitable source of pressure, the hose being provided with a conventional pressure control valve. The cleaner is connected to the pressure hose by a conventional detachable coupling. The cleaner consists of a somewhat flattened tube, more or less oval in cross-section, and has one end open for attachment to the pressure hose, and its other end is closed. A rigid skirt, substantially the length of the oval portion of the tube, is secured longitudinally along one shorter side of the oval tube, and a series of spaced apart, elongated slits are provided in the tube closely adjacent and beneath the skirt, so that air pressure passing therethrough provides jets of air parallel to and closely beneath the skirt, the slits being located so as to be an extension of approximately the maximum diameter of the oval tube. The cleaner is passed closely over the surface of the cut meat and bone, and the pressure jets create a vacuum on the meat surface thus pulling up the bone dust from the meat surface into the jet stream and blowing it parallel to the bottom of the skirt. A dust receptacle, preferably with an overhanging lip extending over the meat block on which the meat is located, serves to receive the dust as the cleaner is swept over the meat surface and meat block surface picking up and blowing the dust into the dust receptacle.

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**3,672,577**

**FLUID BED GRID PLATE ASSEMBLY**

**Walter W. Kramer, Allentown, Pa., assignor to Fuller Company, Catasauqua, Pa.**

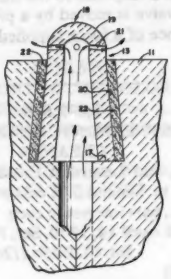
**Filed Oct. 15, 1970, Ser. No. 80,888**

**Int. Cl. B05b *1/06***

**U.S. Cl. 239—557** **9 Claims**

This invention relates to a grid plate assembly for a fluid bed reactor including an apertured grid plate having nozzle elements in the apertures. The apertures and nozzle elements are

structured to prevent dislodgement of the nozzle elements from the grid plate during use of the assembly yet permit ready removal of the nozzle elements from the apertures when desired.



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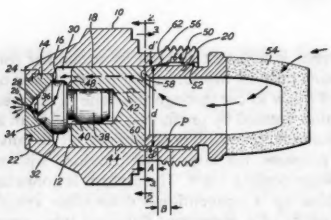
**3,672,578**
**NOZZLE**

**Alex Wayne, Des Moines, Iowa, assignor to Delavan Manufacturing Company**

**Filed Aug. 20, 1970, Ser. No. 65,545**
**Int. Cl. B05b *1/14***
**U.S. Cl. 239—590** **8 Claims**



In a fluid nozzle the clearance between the nozzle body and an orifice retaining member is reduced in a zone between the spray orifice and passages in a fluid distributor and the threads by which the retaining means is threaded into the nozzle body such that the clearance is smaller than the minimum cross sectional dimension of either the spray orifice or the passages in the fluid distributor which distribute the fluid to be sprayed in the spray orifice to prevent clogging by particulate contaminants present on the threads.

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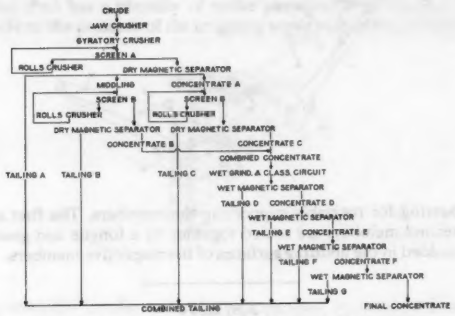
**3,672,579**
**PROCESS FOR BENEFICIATING MAGNETITE IRON ORE**

**James E. Lawver, Edina, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.**

**Filed Aug. 10, 1970, Ser. No. 62,423**
**Int. Cl. B02c *21/00***
**U.S. Cl. 241—24** **5 Claims**

A process for upgrading low-grade magnetite-containing iron ore with minimum fine grinding. The dry ore is first comminuted to between about three-fourths inch and 10 mesh particle size and magnetically separated. The dry tailing is discarded and the concentrate is ground to between about 20 and 100 mesh and again subjected to dry magnetic separation. The dry tailing is again discarded and the concentrate is then finely ground according to conventional practice and subjected to wet magnetic separation. About 90 percent or more of the tailing is discarded dry without fine grinding, permitting easy disposal without possible ecological damage due to lake and stream pollution.

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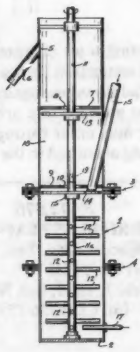
**3,672,580**
**SYSTEM FOR FEEDING GRINDING MEDIA TO CONTINUOUS ATTRITION MILL**

**John David Nye, Prescott, Ontario, Canada, assignor to Ferrox Iron Ltd., Prescott, Ontario, Canada**

**Filed Dec. 8, 1970, Ser. No. 96,128**
**Int. Cl. B02c *17/16***
**U.S. Cl. 241—79** **5 Claims**



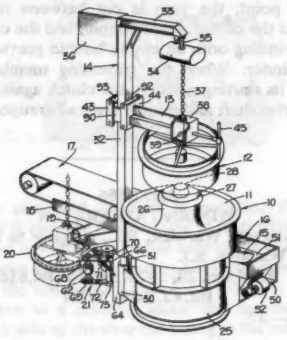
A system is described for feeding grinding balls to a continuous attrition mill of the type comprising a vertical cylindrical vessel having an inlet in the lower portion thereof, an annular suppression plate with an axial opening mounted in an upper region of the vessel, a horizontally rotatable disc mounted immediately below the suppression plate and a plurality of rotatable impellers within the vessel. The grinding ball feeding system of the invention comprises a pipe extending downwardly through a separate opening in the suppression plate and terminating a small distance above the rotatable disc. The pipe is arranged in relationship to the rotatable disc such that during operation the rotating disc draws the balls from the lower end of the pipe and delivers these to the outer walls of the vessel where they tend to sink down towards the bottom without interfering substantially with the operation of the mill.

3,672,581

## DRIVING APPARATUS FOR HOIST PAN

James P. Denight, Cincinnati, and George A. Burgess, Fairfield, both of Ohio, assignors to Sweco, Inc., Los Angeles, Calif.

Filed May 19, 1969, Ser. No. 825,861
Int. Cl. B02c *19/00*; B65g *7/00*
U.S. Cl. 241—101 R 6 Claims



A material handling system for vibratory finishing or grinding mills into which are placed materials and abrasive media and wherein the materials are operated upon. In a finishing mill the materials are parts which are finished, polished, or deburred, and in a grinding mill the materials usually are chemicals which are reduced in size. The system includes a vibratory mill into which such materials and media are placed, a vibratory screen separator for separating the materials from media after completion of the operation thereon, a hoist pan for handling the media or material and media, and a jib hoist system for moving and positioning the pan. Media or material and media are loaded into the pan, and same is lowered to the top of the finishing machine causing the load to be evenly dumped into the finishing machine. After the finishing operation, the material may be moved or transported in any suitable manner to any further operation stage, and the media is returned to the hoist pan. A pan driving mechanism is provided for rotating the pan as the media is supplied thereto from the separator or mill such that the pan is evenly loaded. Several bottom-dumping pan configurations are disclosed which provide a relatively even discharge of the media into the mill when the pan engages the mill.

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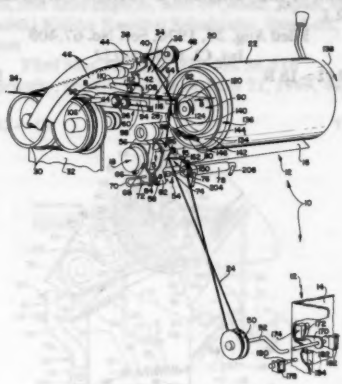
3,672,582

## YARN HANDLING

James N. Allam, Woonsocket, and Joseph J. Morrocco, III, Cranston, both of R.I., assignors to Leesona Corporation, Warwick, R.I.

Filed Feb. 19, 1970, Ser. No. 12,583
Int. Cl. B65h *54/02*
U.S. Cl. 242—18 R 20 Claims

A take-up machine having a rotating spindle on which a tube is releasably clamped for winding of a strand of yarn onto the tube to form a yarn package. The machine automatically threads the strand of yarn onto the spindle to start winding of the yarn onto the tube and, if desired, first winds a tailing end about an end of the tube, and then winds a body of yarn on the tube to form the yarn package. A variable speed spindle drive is automatically operated at a manually pre-set constant speed during thread-up and immediately upon thread-up is switched to a speed different from the constant pre-set speed and conventional control of the winding speed.



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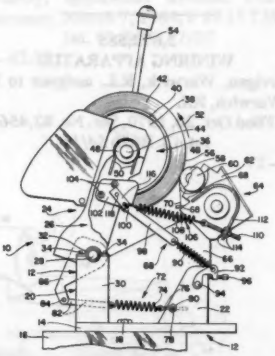
3,672,583

## WINDING APPARATUS AND METHOD

Robert E. Harrison, West Greenwich, R.I., assignor to Leesona Corporation, Warwick, R.I.

Filed Aug. 18, 1970, Ser. No. 64,673
Int. Cl. B65h *54/52*
U.S. Cl. 242—18 R 10 Claims

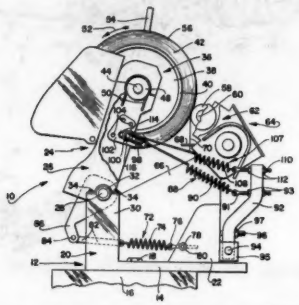


Apparatus and a method for winding a package positioned on a spindle assembly and held against a roller bail with substantially continually decreasing winding pressure as winding progresses and the spindle assembly moves across dead center with gravity first urging the package toward the roller bail and then away from the roller bail. Upon initiating winding, a primary spring functions to urge the package away from the roller bail as the spindle assembly approaches dead center and the weight of the package increases. Later, second and third springs come into play to urge the package against the roller bail. Preferably, the second spring comes into play and counteracts the primary spring well before the spindle assembly reaches dead center and the third spring comes into play when the spindle assembly is proximate dead center.

## 3,672,584
## WINDING APPARATUS

**Frank A. Macedo, Pawtucket, and Thomas W. Perrino, Johnston, both of R.I., assignors to Leesona Corporation, Warwick, R.I.**

**Filed Aug. 27, 1970, Ser. No. 67,408**
**Int. Cl. B65h *54/52***
**U.S. Cl. 242—18 R** **10 Claims**



Apparatus for winding a package rotatably mounted on a spindle assembly and held against a roller bail with selectively adjustable decreasing winding pressure as winding progresses and the spindle assembly moves across dead center, with gravity first urging the package toward the roller bail and then away from the roller bail. Upon initiating winding, a primary spring urges the package in a direction away from the roller bail to reduce winding pressure and then second and third springs urge the package against the roller bail. The second and third springs are connected with a lever or, alternatively, each is connected with a respective lever, for adjusting the point at which these springs come into play to regulate the winding pressure.

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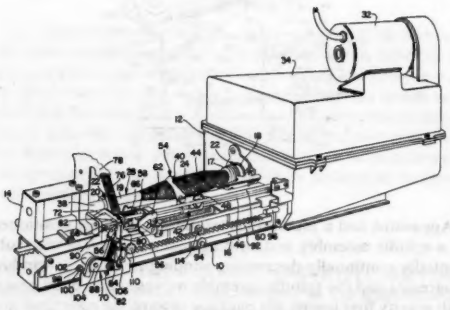
## 3,672,585
## WINDING APPARATUS

**James A. Kerrigan, Warwick, R.I., assignor to Leesona Corporation, Warwick, R.I.**

**Filed Oct. 20, 1970, Ser. No. 82,456**
**Int. Cl. B65h *54/14***
**U.S. Cl. 242—27** **6 Claims**



A winding machine, such as a UNIFIL loom winder, manufactured by Leesona Corporation, Warwick Rhode Island 02887, has a spindle assembly for receiving and rotating a bobbin, and a traversing assembly including a traversing member having a pair of jaws releasably threadedly secured to a traverse rod, during winding, for guiding a strand of yarn being wound onto the bobbin. The traversing and spindle assemblies are driven by mechanism within a casing of the winder. This mechanism includes a continuously driven drive shaft connected by a clutch with a spindle shaft which rotates the bobbin and rotatably receives cams for operating the threaded traverse rod to provide the traversing member with builder and reciprocating motions. When the clutch is drivingly engaged it supports an end of the spindle shaft, and when the clutch is disengaged this end of the spindle shaft is supported on a unit which journals the shaft for axial movement. At the end of winding of a bobbin, bobbin doffing and donning operations are initiated, the clutch between the drive shaft and the spindle shaft is released, the jaws are released from the traverse rod and the traversing member is returned to its starting point, the yarn is cut between the traversing member and the doffed, filled bobbin, and the cut yarn is engaged for winding onto an empty bobbin previously donned into the winder. When the traversing member has been returned to its starting position, the clutch again drivingly engages the drive shaft and spindle shaft whereupon the cycle is repeated.

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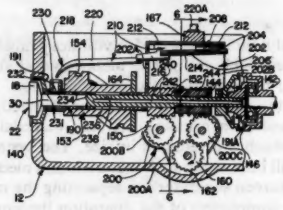
## 3,672,586
## WINDING APPARATUS

**Robert E. Morton, Warwick, R.I., assignor to Leesona Corporation, Warwick, R.I.**

**Filed Oct. 28, 1970, Ser. No. 84,816**
**Int. Cl. B65h *54/14***
**U.S. Cl. 242—27** **8 Claims**



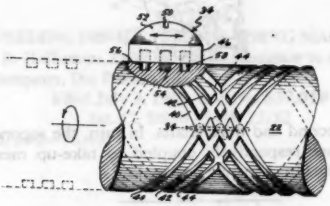
A winding machine, such as a UNIFIL loom winder, manufactured by Leesona Corporation, Warwick, Rhode Island 02887, has a spindle assembly for receiving and rotating a bobbin, and a traversing assembly including a traversing member releasably threadedly secured to a traverse rod, during winding, for guiding a strand of yarn being wound onto the bobbin. Upon completion of winding, the traversing member is released from the traverse rod and the traversing member is returned to its starting point, the yarn is cut between the traversing member and the doffed, filled bobbin, and the cut yarn is engaged for winding onto an empty bobbin previously donned onto the winder. The traversing and spindle assemblies are driven by mechanism within a casing of the winder. This mechanism includes a continuously driven drive shaft connected by a clutch with a spindle shaft during winding, and disengaged at the termination of winding. A power take-off from the spindle shaft drives cams rotatably received on the spindle shaft for rotating and reciprocating the threaded traverse rod to provide the traversing member with builder and reciprocating motions. Lubrication of the rotatable cam and spindle shaft, and other portions of the mechanism within the casing, is provided by a rotating slinger which projects atomized lubricant upwardly through a duct and onto aprons of an upper duct from which the lubricant flows through channels and passages to lubricate the cam and spindle shaft. When the traversing member has been returned to its starting position, a cycling mechanism causes the clutch to again drivingly engage the drive shaft and spindle shaft whereupon the cycle is repeated.

3,672,587

## TRAVERSE CAM AND FOLLOWER FOR WINDERS

John H. Pierce, Charlotte, N.C., assignor to R. H. Bonligny Inc., Charlotte, N.C.

Filed Jan. 5, 1971, Ser. No. 104,110
Int. Cl. B65h 54/30
U.S. Cl. 242—43 4 Claims



A traverse cam and follower is provided for winding machines that is capable of operating at high winding speeds to much better advantage than has heretofore been possible. The traverse cam is characterized by a reversing spiral of three grooves, and the follower by a shoe for riding in the central groove to serve as a crossing guide and by stud elements spaced at each side of the shoe for riding in the outer grooves to bear the cam thrust. This arrangement allows excellent control of the follower during reversal at the end of each stroke, results in remarkably smooth and quiet operation, and adapts well to use in traverse cams of considerably smaller diameter than is usual, which lighten the traverse mechanism substantially and lower cam surface speed so as to lessen follower wear materially.

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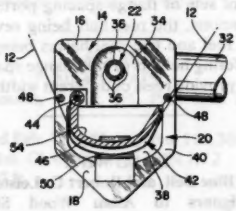
3,672,588

## STRAND CONTROL APPARATUS

William M. Bense, Barrington, R.I., assignor to Leesona Corporation, Warwick, R.I.

Filed Sept. 8, 1970, Ser. No. 70,004
Int. Cl. B65h 57/00
U.S. Cl. 242—45 18 Claims



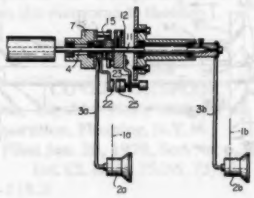
An apparatus and a method embodied in a guide for an advancing strand of yarn. The guide retains the strand on a receiver which is supported on a cushion of air. The receiver is pivotally retained between opposed members extending from a base of the guide. The strand urges the receiver toward the base and the cushion of air, which is introduced between the members proximate the base, urges the receiver away from the base. As the air is vented about the receiver the advancing strand is substantially out of contact with the air to prevent removal of coatings from the strand or entanglement of filaments of the strand. Response of the receiver to variations in the force exerted thereon by the strand may be programmed by regulating venting of the air about the receiver.

3,672,589

## DETECTION ARRANGEMENT OF WINDING SPEED ON A TAKE-UP WINDER

Shoji Nakai, and Akio Higuchi, both of Osaka, Japan, assignors to Kabushiki Kaisha Kamitsu Seisakusho, Itami-shi, Hyogo-ken, Japan

Filed May 18, 1970, Ser. No. 38,418
Claims priority, application Japan, May 21, 1969, 44/38749
Int. Cl. B65h 59/38
U.S. Cl. 242—45 7 Claims



Improvement in or relating to an arrangement for detecting winding speed of running strandular materials on a multiple packages on a common spindle type take-up winder having multiple compensator arms with dancer rolls for the strandular materials independently operable, upon speed deviation of the strandular materials, on a common shaft connected to a unit for controlling the spindle rotational speed and the detection is carried out with possible minimum tension fluctuation within and/or between the strandular materials.

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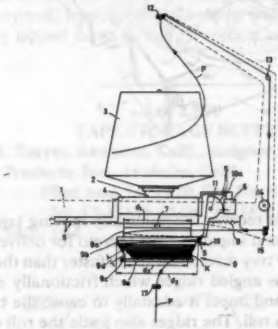
3,672,590

## THREAD STORAGE AND DELIVERY DEVICE FOR TEXTILE MACHINES

Karl Isac Joel Rosen, Villa Haga, Ulricehamn, Sweden

Filed Oct. 10, 1969, Ser. No. 865,302
Claims priority, application Sweden, Oct. 14, 1968, 13807/68; Germany, March 7, 1969, P 19 11 735.2
Int. Cl. B65h 51/20
U.S. Cl. 242—47.12 17 Claims



A thread storage and delivery device for conveying a thread from a spool to a working point on a textile machine. The thread is delivered to a storage drum in a substantially tangential direction in the region of a slide cone. The thread is drawable from the storage drum in an axial direction while the force serving to draw the thread from the spool is imparted to the thread by means of a friction driving surface which is looped at least once by the thread. The storage drum has a storage section which is smaller in diameter than the remainder portion thereof and the thread turns are conveyed from the slide cone in an axial direction into the storage section to form at that point a double layer, or multiple layer coil from which the thread can be drawn out.

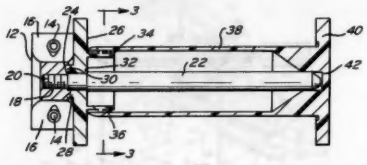
## 3,672,591
## DISPENSING HOLDER FOR PAPER ROLLS AND THE LIKE

James G. Davis, 41 Lincoln Ave., Yeadon, Pa.

Continuation-in-part of Ser. No. 853,787, Aug. 28, 1969, Pat. No. 3,593,936. This application Aug. 14, 1970, Ser. No. 63,682

Int. Cl. A47k *10/22, 10/24*

U.S. Cl. 242—55.2 4 Claims



A holder and dispensing means for rolls of paper and the like which comprises a support at one end and a sleeve rotatably connected to the support and constructed to snugly receive the core of the roll. The roll rotates together with the sleeve without bouncing or wobbling on the sleeve. The sleeve also acts as an anchor when a piece of the paper strip is pulled off the roll at one of the score lines.

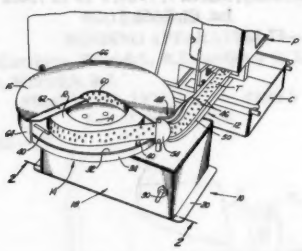
## 3,672,592
## TAPE WINDING MEANS

William A. Nichols, 5617 Hawthorne, Montclair, Calif., and Ralph E. Simpson, 604 E. Arrow Hwy., Upland, Calif.

Filed March 2, 1970, Ser. No. 15,616

Int. Cl. B65h *17/48*

U.S. Cl. 242—55.21 7 Claims



Tape guide means receive longitudinally moving tape in a horizontal position and impart a twist thereto for delivering it edgewise to a rotary tray driven at a speed faster than the tape. The tray bottom has angled ridges which frictionally engage the delivered tape and impel it adaxially to cause the tape to coil and form into a roll. The ridges also jostle the roll during formation for tightening the coiled tape into a compact roll.

## 3,672,593
## SELECTIVE SCANNING CONTROL FOR PROJECTION APPARATUS

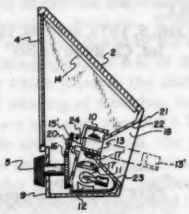
Frederick G. Knowles, Rochester, and Clarence R. Taylor, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 3, 1970, Ser. No. 8,309

Int. Cl. B65h *17/02*; G09f *11/24*

U.S. Cl. 242—67.4 6 Claims

Apparatus is disclosed for scanning and projecting a set of images carried by a filmstrip wherein the strip may be transported in either direction by a single control knob. Rotation of the control knob causes a main or first drive shaft to be moved to either a first or second position and to there respectively engage either second and third shafts. In turn, the second and third shafts are respectively coupled to take-up members about which the filmstrip may be wound.



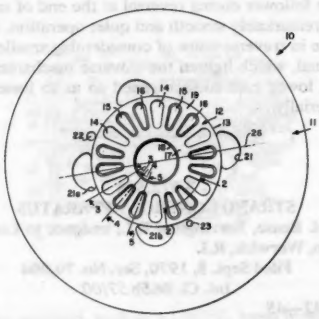
## 3,672,594
## REEL

Robert W. Selleck, San Jose, and Philip H. Allen, Los Gatos, both of Calif., assignors to Cycle Equipment Company, Los Gatos, Calif.

Filed Dec. 15, 1969, Ser. No. 885,142

Int. Cl. B65h *75/14*

U.S. Cl. 242—71.8 3 Claims



A reel half having an outer flange and an inner hub including a plurality of sets of flange spacing portions of different heights or elevations, the reel half being reversible to form either half of a reel and two reel halves being capable of assembly with differing heights of said flange spacing portions in contact so as to provide reels of different widths.

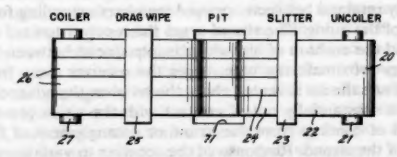
## 3,672,595
## DRAG WIPE

Richard Jablin, Blue Bell, and Robert G. Leister, Ambler, both of Pa., assignors to Allan Wood Steel Company, Conshohocken, Pa.

Division of Ser. No. 801,004, Feb. 20, 1969, Pat. No. 3,559,862. This application March 20, 1970, Ser. No. 21,370

Int. Cl. B65h *23/10, 35/02*

U.S. Cl. 242—75.2 3 Claims




A mechanism for slitting and coiling work sheet or strip including a slitter from which a plurality of work mults of dif-

ferent thickness is obtained, a drag wipe engaging the various mults coming from the slitter and providing generally uniform frictional drag on the different mults, a common winder receiving the various mults and winding them into coils, and a looping pit interposed between the slitter and the drag wipe for receiving loops of some of the mults. In a preferred form a table means selectively covers the looping pit in order to aid in threading in the forward ends of the mults.

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**3,672,596**

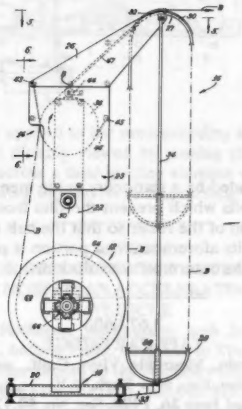
**FEEDING DEVICE FOR STRAPPING MACHINE**

**Anton R. Hoffmann, Lake Forest, Ill., assignor to A. J. Gerrard & Company, Des Plaines, Ill.**

**Filed July 3, 1969, Ser. No. 839,010**

**Int. Cl. B65h** *23/08, 25/32*

**U.S. Cl. 242—75.43** **7 Claims**



A feed device for supplying a continuous length of strapping band from a supply reel having an accumulator assembly and an intermittent drive assembly. The accumulator assembly stores a variable segment of the strapping band to provide a constant supply of the strapping band to a strapping machine. The intermittent drive assembly starts to feed strapping band into the accumulator upon the stored segment reaching a certain low value at a rate greater than the withdrawal rate from accumulator and continues this feeding process until the stored segment reaches a certain high value.

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**3,672,597**

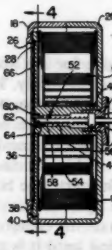
**MEMO TAPE**

**Jervis C. Williamson, R.F.D. #5, P.O. Box 196, Norwich, Conn.**

**Filed Feb. 1, 1971, Ser. No. 111,316**

**Int. Cl. G01b** *3/10;* **B43l** *1/12*

**U.S. Cl. 242—107 R** **6 Claims**



A memo measuring device of the type comprising a housing and a coiled extendible and retractable measuring tape therewithin. The housing has front and rear shells and means connecting the same and a front housing opening extends throughout the major portion of the face area of the housing. A small opening is provided in the rear housing shell. A waxed plate disposed within the housing adjacent the front shell opening has a transparent sheet thereover for dimensional notations and other memoranda. A stem extending rearwardly from the plate is hollow and opens through the rear shell opening. A plunger within the stem opening has an associated return spring and a front end portion engageable with the transparent sheet. Manual finger pressure urging the plunger forwardly displaces the transparent sheet from the waxed plate and clears the memoranda thereon.

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**3,672,598**

**COVER FOR SPOOL**

**Ivan H. Saveth, Bayside, N.Y., assignor to Thermoformed Plastics Corporation, Flushing, N.Y.**

**Filed Jan. 28, 1970, Ser. No. 6,361**

**Int. Cl. B65h** *75/26, 75/10*

**U.S. Cl. 242—118.2** **7 Claims**

A protective cover for a thread receiving spool designed to protect it from crushing during the thread receiving operation and a method of making the same is disclosed. The cover is generally conical in shape and has a plurality of inwardly directed ribs which rest against the outer surface of the spool when the cover is placed around it. The outer surface of the conical cover is the thread receiving surface of the combination. The cover is formed by molding a suitable material, such as polystyrene, into the desired shape and is held in conical shape by lapped joints forming a vertical seam in the finished cover.

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**3,672,599**

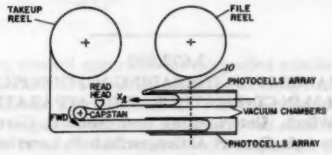
**TAPE STORAGE BUFFER**

**Mario A. Torres, Anaheim, Calif., assignor to California Computer Products, Inc., Anaheim, Calif.**

**Filed Aug. 14, 1970, Ser. No. 63,872**

**Int. Cl. G11b** *15/06, 15/58, 23/12*

**U.S. Cl. 242—184** **4 Claims**



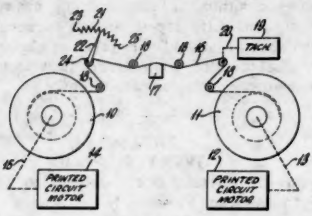

Variable center positioning can be used to increase the effective storage length of a vacuum buffer chamber. Both position and velocity are controlled in accordance with the direction of capstan rotation so as to maintain the loop at the top or bottom of the vacuum chamber.

**3,672,600**

## REEL-TO-REEL TAPE STORAGE APPARATUS

Robert A. Carlson, 230 Newton Road, Plainview, N.Y., and Thomas P. Foley, 12 Janes Lane, Huntington, N.Y.

Filed April 2, 1969, Ser. No. 812,767
Int. Cl. B65h *25/04, 25/22;* G11b *15/48*
U.S. Cl. 242—186 3 Claims




The disclosure describes an information tape storage apparatus without tape loop storage means or tape driving means interposed along the path of the tape as the tape moves from the information processing station to the take-up reel. To provide such tape motion, including the usual start-stop characteristics, a tachometer generates a signal indicative of tape speed which is compared differentially with a ramp signal to develop a control signal for a low inertia printed circuit motor that is connected to turn the take-up reel.

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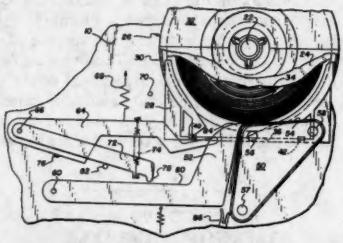
**3,672,601**

## FILM FEEDING MECHANISM WITH MOVABLE CARTRIDGE MOUNTING MEANS

John J. Bundschuh, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 28, 1970, Ser. No. 76,080
Int. Cl. G03b *1/04;* G11b *15/32*
U.S. Cl. 242—192 12 Claims



In a simplified film feeding mechanism of the type including a drive member and a stripper finger for contacting the periphery of a roll of film or other strip material to separate the leading end thereof from the roll and to feed it into a threading channel of a motion picture projector or similar apparatus, means for mounting the film roll so that it may be moved into engagement with the drive member and stripper finger.

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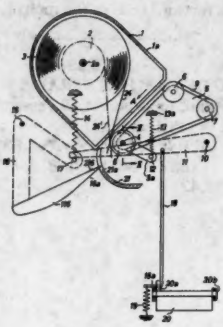
**3,672,602**

## MECHANISM FOR THREADING MOTION PICTURE FILM IN CINEMATOGRAPHIC APPARATUS

Herbert Wilsch, Unterhaching near Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed March 18, 1970, Ser. No. 20,558
Claims priority, application Germany, March 28, 1969, P 19 15 969.4
Int. Cl. G03b *1/02;* B65h *17/14;* G11b *15/32*
U.S. Cl. 242—192 10 Claims

Automatic film threading mechanism for use in motion picture projectors, comprising a driven endless elastic belt a portion of which is pivotable into engagement with the outermost convolution of film on the core of the supply reel to thereby rotate the reel in a direction to pay out the film. The belt is trained over a roller which rotates about a fixed axis, and such



roller is surrounded by a stationary guide member or flanked by two guide rolls which prevent the film from engaging the belt in the region of the roller so that the belt can engage the film only when its aforementioned portion is pivoted into engagement with the outermost convolution.

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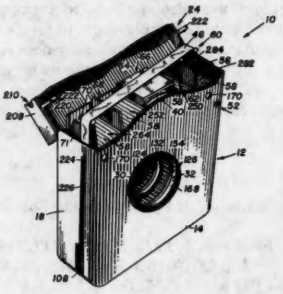
**3,672,603**

## TAPE CARTRIDGE

William W. Swain, Mountain View, Calif., assignor to Cartridge Television, Inc., New York, N.Y.

Filed June 26, 1970, Ser. No. 50,125
Int. Cl. G03b *1/04;* G11b *15/32, 23/04*
U.S. Cl. 242—194 27 Claims



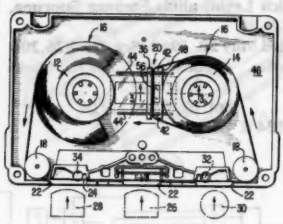
An improved tape cartridge for use with a tape transport of the type having a rotary head assembly. The cartridge is of the reel-over-reel type and a flexible, magnetic tape coupled to the reels of the cartridge can be drawn outwardly thereof and along a portion of a rotary head assembly by tape guide or pick-up means receivable within recesses near an open extremity of the cartridge. The cartridge housing has a pivotally mounted closure near the open extremity to cover the tape and releasable latch means on the closure holds the latter coupled to the cartridge housing until it is moved into an operative position. A releasable brake in the cartridge housing holds the reels against movement until the cartridge is moved into said operative position.

3,672,604

## TAPE CARTRIDGE INCLUDING DIRECT VIEWING OF CUE INDICIA

Alan Beaumont, 359 Wildwood Road, Stamford, Conn.

Filed Oct. 8, 1970, Ser. No. 79,189
Int. Cl. G03b *1/04*; G11b *15/32, 23/04*
U.S. Cl. 242—199 11 Claims



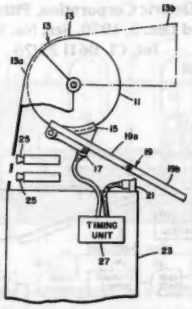
Cue indicia applied to the non-recording surface of a magnetic tape are directly viewed by passing the non-recording tape surface across a tape guiding element which includes a mirror for viewing the non-recording surface.

3,672,605

## SYSTEM FOR DEPLOYMENT OF A SPHERICAL BODY FROM THE NOSE OF AN ACCELERATING BALLISTIC VEHICLE

Leonard M. Hoffman, Burlingame, and John B. Kimball, Menlo Park, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Feb. 16, 1971, Ser. No. 115,450
Int. Cl. B64g *1/10*
U.S. Cl. 244—1 SS 10 Claims



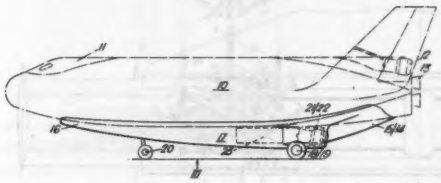

A system for lateral deployment of a spherical body from an accelerating ballistic vehicle. The smooth spherical body is constrained during the launch by a visor-like nose fairing, a ramp and a retractable chock, all located in the apex of the vehicle. Prior to separation, the nose fairing opens and the ramp is extended. At attainment of the desired separation velocity, the chock is retracted permitting the sphere to roll down the ramp under the thrust of the ballistic vehicle. During the roll down the ramp the sphere picks up spin velocity, normal to its roll axis, as required for re-entry temperature control. Lateral reaction of the vehicle resulting from the separation of the spherical body from the vehicle is counteracted by rocket motors deployed in the vehicle.

3,672,606

## TROLLEY FOR RECOVERABLE SPACECRAFT

Gerald D. Walley, Long Ridge, near Preston, England, assignor to British Aircraft Corporation Limited, London, England

Filed Dec. 31, 1969, Ser. No. 889,408
Int. Cl. B64g *1/00*
U.S. Cl. 244—1 SS 6 Claims



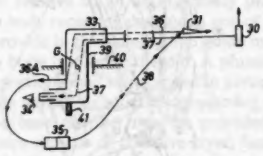
A recoverable spacecraft has rocket propulsion engines for vertical flight into space, and has lifting surfaces for horizontal flight after re-entry into the earth's atmosphere. When transporting the craft over land, its size makes road transport difficult, and makes its flight energized by rocket motors uneconomical. The present invention provides a trolley which can be releasably attached to the craft for such transportation. The trolley has wheels, a braking system and may have at least one air breathing engine to energize transportation flight. It forms a streamlined blister beneath the spacecraft, but has itself no lifting surfaces, the flight of the combined spacecraft and trolley using the lifting surfaces of the craft. The trolley is attached to and released from the craft only when the two are stationary on the ground.

3,672,607

## SIGHTING TELESCOPE INFRA-RED DIRECTION FINDER UNIT IN A TELEGUIDING DEVICE FOR MISSILES

Emile Stauff, Versailles, and Roger Fleury, Boulogne-sur-Seine, both of France, assignors to Nord-Aviation Societe Nationale de Constructions Aeronautiques, Paris, France

Continuation-in-part of Ser. No. 413,481, Nov. 24, 1964, abandoned. This application March 12, 1969, Ser. No. 806,428
Claims priority, application France, Nov. 28, 1963, 955387
Int. Cl. F41g *1/40, 7/00, 9/00*
U.S. Cl. 244—3.16 6 Claims

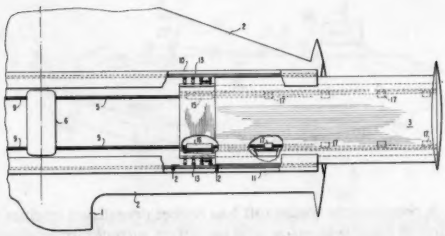


A firing control apparatus for teleguided missiles comprising an assembly of a periscopic sighting telescope and an infrared goniometer adapted to locate, with respect to the sighting axis of a target, a missile emitting infra-red radiation, and to determine its errors of trajectory with respect to the sighting axis, and an associated teleguiding system giving orders at every instant so as to correct the errors measured by the infrared goniometer. The whole assembly is fixed in one casing having a support permitting pivotal movement of the combined sighting telescope and goniometer about two perpendicular axes, one of which passes through the center of gravity of the apparatus, the optical axes of the telescope and the goniometer constituting two parallel optical paths.

## 3,672,608
## HYDRAULIC MECHANISM

Gaspare L. Gioia; Norris H. Switzer, and John K. Willerton, all of Merritt Island, Fla., assignors to Omniomics, Inc., Brevard County, Fla.

Filed April 10, 1970, Ser. No. 27,359
Int. Cl. B64c 3/54
U.S. Cl. 244—43 43 Claims

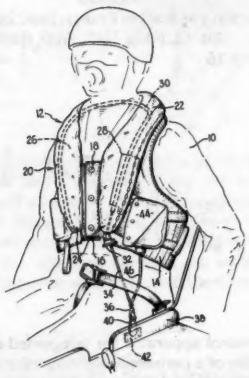


A hydraulic mechanism for supporting a telescopically mounted wing section of an extendible aircraft wing. Hydraulic cylinders, fixedly attached to one telescopic wing section, are in slidable or rolling contact with the other wing section via pistons. Cylinders are mounted in inboard and outboard sections. In one embodiment, single groups of inboard and outboard cylinders are hydraulically interconnected with a hydraulic accumulator so as to provide load dispersion, wear adjustment and flutter dampening. In a second embodiment, such results are obtained by the interworking of different hydraulic circuits.

## 3,672,609
## INFLATABLE BODY-ATTACHMENTS FOR MARINE LIFE-SAVING

James Mitchell Hawkins, Ashton-Under-Lyne, England, assignor to Frankenstein Group Limited

Filed Oct. 6, 1970, Ser. No. 78,514
Int. Cl. B64d 25/18
U.S. Cl. 244—122 AE 10 Claims

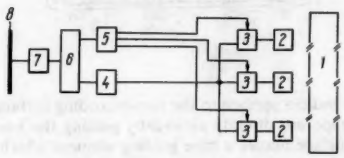


This invention concerns a life-saving appliance comprising an inflatable portion which when the appliance is unactivated is stowed compactly in a pouch, means for securing the pouch closely to the body of the wearer, and a fastening for the pouch adapted for release or disablement only through the medium of a flexible traction member to permit deployment of the appliance on inflation thereof, characterized in that the release or disabling means for the pouch fastening is adapted for direct or indirect connection to an aircraft ejection seat or the lift webbing of an associated parachute so that on separation of the wearer from the seat or deployment of the parachute, the pouch will be free to open on inflation of the appliance, and by a water-responsive mechanism adapted to initiate self-inflation of the appliance on immersion.

## 3,672,610
## ELECTRIC SYSTEM OF A DEVICE FOR DEICING THE SURFACE OF THIN-WALLED STRUCTURES

Igor Anatolievich Levin, ulitsa Stepana Supruna, 12, kv. 74, Moscow, U.S.S.R.

Filed May 20, 1969, Ser. No. 826,204
Claims priority, application U.S.S.R., June 24, 1968, 1250546
Int. Cl. B64d 15/16
U.S. Cl. 244—134 R 4 Claims

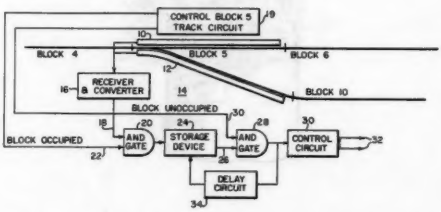


A system is disclosed for deicing the skin surface of aircraft and comprises a power supply unit to which are connected an electrical power accumulator and a program switch. Low inertia converters such as magnetostrictive vibrators are provided in close proximity to the skin surface and are fed from the power supply unit via key switches each having one input connected to the electrical power accumulator while its second input is connected to the program selector switch such that the switch will produce successive single or bundles of electrical pules separated by pauses at the converters.

## 3,672,611
## VEHICLE CONTROL SYSTEM AND METHOD

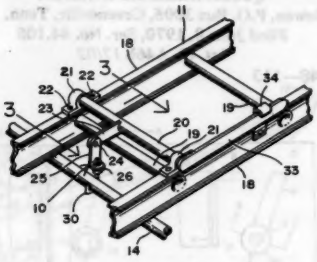
George M. Thorne-Booth, Tarzana, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 3, 1970, Ser. No. 94,849
Int. Cl. B61l 23/26
U.S. Cl. 246—28 R 9 Claims




A path along which a vehicle traverses is divided into a plurality of blocks. In each block two devices sense the presence of a vehicle, and one of the devices is used to sense the absence of the vehicle. The two devices concurrently sensing the presence of a vehicle provide a presence signal to be stored which is indicative of a vehicle having been present in the block. In response to the sensing of the absence of the vehicle by the one device during the time the presence signal is stored, a control signal is generated. A predetermined amount of time after the control signal is generated the storage of the presence signal is discontinued.

**3,672,612**
**LADDER LATCHING DEVICE**
**Clyde A. Laing, Jr., 920 S. W. 101st Ave., Miami, Fla.**
**Filed Feb. 11, 1971, Ser. No. 114,501**
**Int. Cl. B60r 9/04**
**U.S. Cl. 248—361 R** **2 Claims**



A latching device for releasably securing a ladder to a vehicle having racks secured thereon, the latching device being mounted on the side rails of the ladder on the lower side thereof and consisting of a rotatable shaft secured to the side rails, with a handle mounted on the end of the shaft and a hook member secured to the side rail for securing the handle in the locked position. At the middle of the shaft there is secured an arm portion at whose free end one end of an adjustable hooking member is pivotally attached with the other end engaging the rack for locking the ladder thereto.

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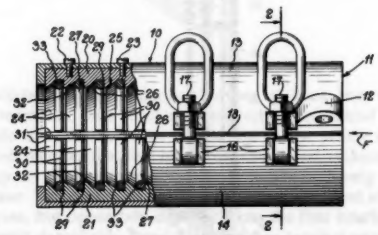
**3,672,613**
**DISTRIBUTING CLAMPING STRESS DEVICE FOR CABLE LAYING**
**Agostino Oriani, Sesto San Giovanni, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy**
**Filed March 27, 1970, Ser. No. 23,297**
**Claims priority, application Italy, July 10, 1969, 19410 A/69**
**Int. Cl. F16l 3/10**
**U.S. Cl. 248—62** **8 Claims**



A clamp or stopper for suspending a cable being laid which comprises a generally cylindrical inner clamp having frustoconical interior grooves receiving resilient rings for engaging the cable surface and an outer housing for receiving and holding the clamp and for attachment to a suspending rope or ropes.

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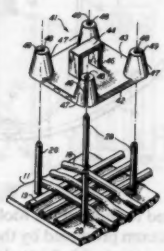
**3,672,614**
**PLASTIC HOLDDOWN DEVICE FOR LOGIC CHASSIS**
**Franklin D. Guerry, Burlington, N.C., assignor to Western Electric Company, Incorporated, New York, N.Y.**
**Filed Sept. 17, 1970, Ser. No. 73,155**
**Int. Cl. F16l 3/10**
**U.S. Cl. 248—68** **7 Claims**

A resilient holddown device is employed to secure loose strip material to an underlying support that has affixed thereto a plurality of upward extending projections bounding the strip material. The device includes a base which has a plurality of openings therethrough. Each opening is aligned with an associated one of the projections on the support. A corresponding plurality of slits individually extend traversely from each opening to the periphery of the base. Each of the openings has a cross-sectional dimension sufficiently small to grip the projections when the base is lowered into engagement with the bounded strip material.



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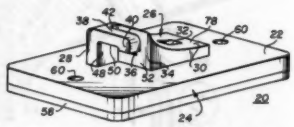
**3,672,615**
**STRAP SUPPORT**
**Arthur A. Florentino, Piscataway, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.**
**Filed Feb. 17, 1971, Ser. No. 116,164**
**Int. Cl. F16l 3/14**
**U.S. Cl. 248—74 PB** **16 Claims**



A strap support comprising a selectively recessed strap retaining member disposed on the upper surface of an appropriately contoured base member affixable to a mounting member. The inwardly directed surfaces of adjacent, upstanding, perpendicularly disposed portions of the retaining member in combination with an overhanging member partially define an open-ended strap head receiving cavity selectively aligned relative to an appropriately proportioned extending strap body receiving passage in one of the upstanding portions to provide both retaining and guide means for an extending strap body insertable therein. A plurality of upstanding recessed portions may be arranged in juxtaposed relationship to provide a multiple of spaced, opposing strap receiving passages. The base member may be provided with suitable mounting means such as an adhesive layer, fastener receiving openings, or the like.

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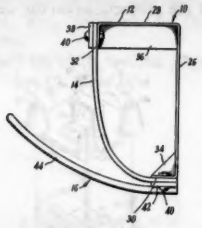
**3,672,616**
**TOOL HOLDER**
**David H. Hunt, Simsbury, Conn., assignor to The Spencer Turbine Company, West Hartford, Conn.**
**Filed June 19, 1970, Ser. No. 47,776**
**Int. Cl. A47l 5/00**
**U.S. Cl. 248—75** **9 Claims**

A holder for supporting and sealing a vacuum tool connected to a vacuum producing system and having an inlet opening for the passage of air in response to vacuum produced by the system and comprising a generally L-shaped wall bracket, a flexible sheet of substantially air impervious materi-

al connected to and loosely extending between the free end portions of the bracket, and a tool support member carried by



the bracket and adapted to support the tool in close proximity to the sheet so that vacuum produced by the system draws the sheet into sealing engagement with the tool inlet opening.

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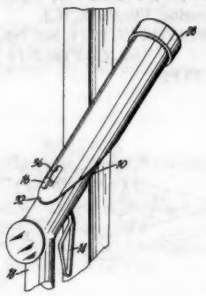
**3,672,617**
**HANGER FOR HOSE NOZZLE**
**Elvin E. Neyendorf, Fredericksburg, Iowa, assignor to The Raymond Lee Organization, Inc., New York, N.Y.**
**Filed Nov. 4, 1970, Ser. No. 86,713**
**Int. Cl. B05l** *11/12*
**U.S. Cl. 248—75** **1 Claim**



A hanger for a hose nozzle pivotally secured to a vertical support and provided with a hollow enclosure for holding the nozzle detachably and covering the discharge end of the nozzle.

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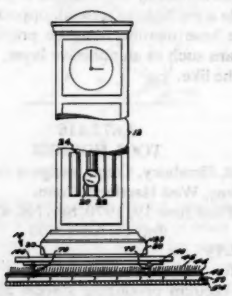
**3,672,618**
**LEVELER**
**Clifford C. Janda, 9717 Cady Ave., Omaha, Nebr.**
**Filed Oct. 5, 1970, Ser. No. 78,090**
**Int. Cl. A47f** *7/02*
**U.S. Cl. 248—116** **6 Claims**



A support pedestal for grandfather clocks and other free-standing clocks having penetration legs thereon adapted to penetrate through carpeting to cause the weight of the clock to be supported by the hard flooring.

The penetration legs being adjustable with respect to a frame for assisting in the leveling.

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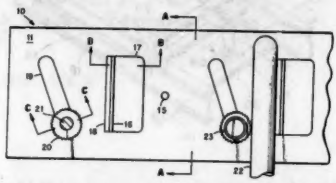
**3,672,619**
**QUICK RELEASE HOLDER**
**Elba W. Bowen, P.O. Box 3005, Greeneville, Tenn.**
**Filed June 8, 1970, Ser. No. 44,105**
**Int. Cl. A46b** *17/02*
**U.S. Cl. 248—113** **3 Claims**



An easily fabricated quick release holder for handled objects such as brooms, mops, garden tools, and the like. The object is gripped between a fixed planar gripping element and a roller gripping element that moves angularly to the fixed element (through the force of gravity). The gripping surfaces of both the fixed and moveable elements are resilient elastomers, having oppositely directed serrations, for additional gripping action.

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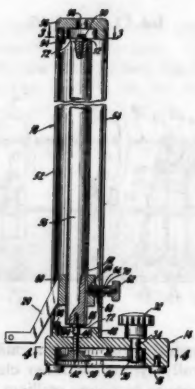
**3,672,620**
**HEIGHT GAUGE**
**Anton Fink, 149 Crescent Drive, Albertson, N.Y.**
**Filed Nov. 17, 1970, Ser. No. 90,324**
**Int. Cl. F16m** *11/04*
**U.S. Cl. 248—125** **12 Claims**



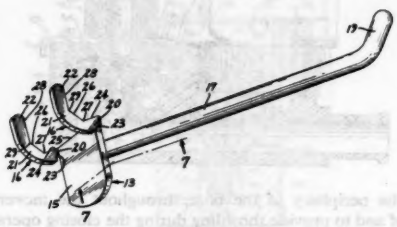
A centrally located shaft, having a longitudinal groove therein, is provided with an arm extending outward of the tubular casing for supporting either an electronic or a mechanical sensor. A coarse adjustment for a rapid movement of the arm and the sensor is provided as well as a fine adjustment which includes spring means for supporting the upper and lower ends of the shaft and a threaded, axially movable screw that is driven through a pulley system by means of the fine adjustment knob.

The aforementioned abstract is neither intended to define the invention of the application which, of course, is measured by the claims, nor is it intended to be limiting as to the scope of the invention in any way.

## 3,672,621
## KEEPER FOR PEGBOARD HARDWARE

Joseph B. Bambenek, Winona, Minn., assignor to Peerless Chain Company, Winona, Minn.

Filed May 6, 1971, Ser. No. 140,863
Int. Cl. A47f 5/00
U.S. Cl. 248—223 7 Claims

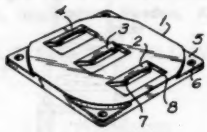


A keeper having supporting peg elements to fit pegboards of different thicknesses and having peg-receiving openings of different diameters.

## 3,672,622
## ARTICLE HANGING APPARATUS

Leon Breslow, 185 E. 162nd St., Bronx, N.Y.

Continuation-in-part of Ser. No. 733603, May 31, 1968, abandoned. This application Aug. 31, 1970, Ser. No. 68,302
Int. Cl. A47f 5/00
U.S. Cl. 248—224 7 Claims



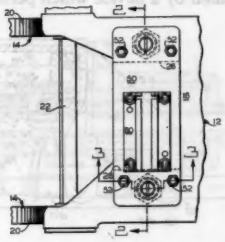
An article hanging apparatus having at least two interlocking members. One bracket is secured at the desired location while the other bracket is fastened to the article to be suspended. The bracket that is secured to the desired location, has integrally formed tongues which protrude obliquely from the surface. The other bracket has corresponding and identical tongues, but oppositely directed from the first bracket so as to permit detachable interlocking of one bracket onto the other. The articles suspended may include planters, wall lamps, hooks, curtain rods, plaques, clocks, tools, ad the like, and may have their positions easily changed.

## 3,672,623
## ADJUSTABLE MOUNT FOR AUXILIARY GUN SIGHT

Frank D. Jones, Moline, Ill., assignor to The United States of America as represented by the Secretary of the Army

Filed Dec. 8, 1970, Ser. No. 96,209
Int. Cl. F41g 1/38
U.S. Cl. 248—226 R 3 Claims

A sight mounting pad is pivotally mounted on the spherical heads of a pair of longitudinally spaced bolts and is secured to a supporting member by four machine bolts two of which are mounted through the mounting pad and supporting member on opposite sides of each of the spherical headed bolts. The spherical headed bolts are adjusted vertically to level the mounting pad longitudinally and by loosening two of the machine bolts on one side of the spherical headed bolts, and

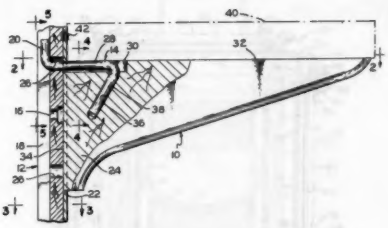


tightening the two machine bolts on the other side thereof, the mounting pad is levelled transversely.

## 3,672,624
## SHELF BRACKET STRUCTURE

James R. Keller, Portland, Oreg., assignor to Baldwin Tool, Inc., Hillsboro, Oreg.

Filed April 2, 1971, Ser. No. 130,605
Int. Cl. A47g 29/02
U.S. Cl. 248—243 5 Claims



A shelf bracket structure includes a wood shelf bracket having a channel in its upper surface extending from the rear end of the bracket part way along the bracket and a hole spaced from such end of the bracket and extending from the bottom of the channel downwardly and rearwardly of the bracket. A metal attaching member has a horizontal body portion received in the channel and a downwardly and rearwardly bent end portion received in the hole of the bracket. The other end of the attaching member has an upwardly extending portion for attaching the bracket to a wall or other support. This upwardly extending portion may be positioned rearwardly of the bracket for hooking engagement in a hole in a support strip or in a modification may have a rear surface flush with the rear end surface of the bracket and a hole extending through the upwardly extending portion to receive a screw or other fastener for securing the attaching member to a wall or other support member.

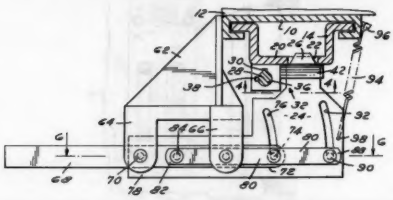
## 3,672,625
## POSITION LOCATOR FOR AN ADJUSTABLE SEAT SUPPORTING ASSEMBLY

Dennis C. Cazabon, Grosse Pointe, and John R. Dunbar, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed March 1, 1971, Ser. No. 120,025
Int. Cl. B60n 1/08
U.S. Cl. 248—429 10 Claims

A position locator for an adjustable seat supporting assembly includes a guide rail over which a seat supporting channel is movable. Structure is provided on the channel to

function with a locator plate formed with the guide rail so that the seat channel is adjustable between a plurality of different positions. Structure is also provided that positively locates front and rear positions for the seat supporting channel. This structure is actuated by a device which permits one to move



the seat directly to either the front or the rear position and then to lock the seat in such a position. With the position locator, one driver of a vehicle containing the seat may move the seat to the rear position and another driver may move the seat to the front position.

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**3,672,626**

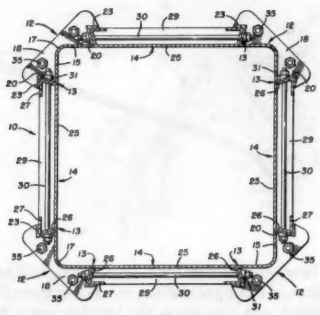
**REUSABLE FORMS FOR CASTING COLUMNS**

**James Thornton, 413 Shoreline Drive, Hampton, Va.**

**Filed March 6, 1970, Ser. No. 17,053**

**Int. Cl. E04g *13/02***

**U.S. Cl. 249—48** **2 Claims**



A reusable form assembly for casting columns from concrete or other suitable material consisting of corner forming members and side-forming panel members disposed therebetween, all detachably bolted together to provide selected cross-section of column formed therein. The form members are in modules of suitable length which can be detachably bolted together in longitudinal relationship. A dovetail joint arrangement is provided between the corners and the cooperating side panels to effectively align the cooperating members and hold them in true alignment until the form is disassembled.

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**3,672,627**

**DIAPHRAGM ASSEMBLY FOR PRESSURE OPERATED PILOT CONTROLLED SHUT-OFF VALVE**

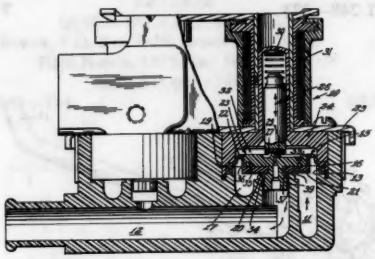
**William R. McCarty, Jr., Skokie; Paul A. Dolter, Roselle, and Wesley S. Swanson, Elk Grove, all of Ill., assignors to Eaton Yale & Towne Inc., Cleveland, Ohio**

**Continuation-in-part of Ser. No. 850,572, Aug. 15, 1969, Pat. No. 3,593,957. This application March 2, 1970, Ser. No. 15,497**

**Int. Cl. F16k *31/06, 31/145***

**U.S. Cl. 251—30** **7 Claims**

A poppet valve for use with a fluid pressure operated pilot controlled diaphragm valve. The poppet valve has a central pilot orifice leading therethrough and bleed holes communicating with mating bleed holes in a diaphragm with a screen means therebetween for allowing fluid passage into the diaphragm pressure chamber and through the central orifice. The poppet valve has a depending stem element fitting within the valve outlet bore arranged to maintain guiding contact



with the periphery of the bore throughout the movement thereof and to provide throttling during the closing operation whereby water hammer effect are avoided and the poppet valve is under positive guidance throughout the operation of the diaphragm valve.

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**3,672,628**

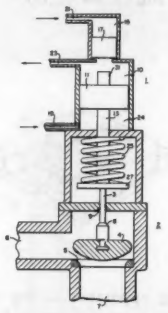
**CONTROLLER FOR A BACK SEATED VALVE**

**Ola J. Aanstad, Chester, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Nov. 25, 1970 Ser. No. 92,733**

**Int. Cl. F16k *31/143, 41/14*; F01b *11/02***

**U.S. Cl. 251—47** **5 Claims**



A hydraulic controller for a back seated steam valve wherein the controller comprises a pair of axially aligned hydraulic cylinders disposed to operate in opposite directions, one of the cylinders having a drive piston and piston rod connected to the valve stem, and the other cylinder having a free piston disposed therein, which opposes the force the drive piston applies to the valve stem as the drive piston approaches the end of its stroke in valve opening direction, thus reducing the back seating force applied to the valve stem by the drive piston. The free piston also increases the initial acceleration of the valves moving parts in closing direction, thus reducing the valve's closing time.

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**3,672,629**

**NON-BLEED PILOT VALVE**

**Johannes Sorteberg, c/o Sorteberg Controls Corp. 540 Connecticut, Norwalk, Conn.**

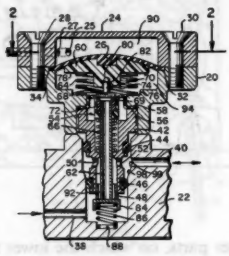
**Filed May 18, 1970, Ser. No. 38,115**

**Int. Cl. F16k *31/165***

**U.S. Cl. 251—61.2** **4 Claims**

A swivel joint between two interconnected members in a pilot valve which are responsive to force differentials and

capable of being extremely sensitive to these force differentials so as to initiate the proper motion to equalize the forces throughout. In the preferred embodiment, the swivel joint comprises a firmly seated ball bearing in the plunger of the pilot valve and an exhaust tube which incorporates a contact post and a biasing spring to urge and maintain the exhaust tube assembly in continual contact with the ball bearing. This



arrangement allows the plunger to pivot freely while the exhaust tube can move laterally with a minimization of frictional contact. The result is a pilot valve which is extremely sensitive and responsive to pressure variations. Pilot valve sensitivity is additionally increased by axially incorporating a pinion with the exhaust tube, while establishing a gap therebetween. This construction provides an unobstructed, controllable path for exhausting gaseous fluids.

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**3,672,630**

**FLAP VALVE FOR SUCTION APPARATUS**

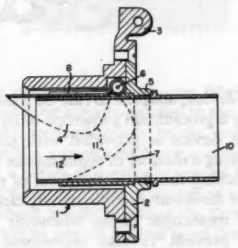
**Per Naumburg, Djursholm, and Jan Olof Norrman, Solna, both of Sweden, assignors to AB Centralsug, Johanneshov, Sweden**

**Filed April 14, 1970, Ser. No. 28,414**

**Claims priority, application Sweden, April 18, 1969, 5544/69**

**Int. Cl. F16k *1/18*; F16l *37/28***

**U.S. Cl. 251—149.2** **4 Claims**



A valve in a wall- or floor-mounted connection box for connecting suction apparatus to a central suction system, said valve being biased to closing position against the action of the negative pressure prevailing in the system.

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**3,672,631**

**VALVE AND ACTUATOR THEREFOR**

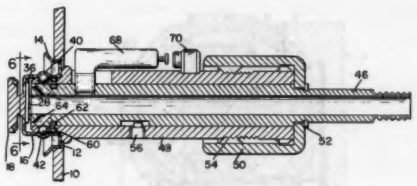
**Frederick G. J. Grise, Box 112, West Brookfield, Mass.**

**Filed Nov. 16, 1970, Ser. No. 89,950**

**Int. Cl. F16l *29/00, 37/28***

**U.S. Cl. 251—149.6** **12 Claims**

A full-flow tank valve and valve actuator, the valve comprising a thimble adapted for application to a tank and having an apertured bottom forming a seat, a movable imperforate member to open or close the apertures, said member including guides extending through certain of the apertures, and resilient means acting on the guides to draw the member to valve closed position against the bottom, said actuator includ-



ing means for engaging the guides and opening the valve and applying gas to the tank therethrough, with locking means for the thimble.

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**3,672,632**

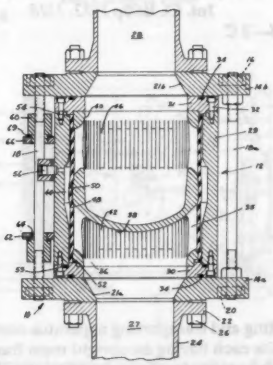
**SWING OUT VALVE STRUCTURE**

**Peter C. M. Chow, San Jose, Calif., assignor to Grove Valve and Regulator Co., Oakland, Calif.**

**Filed May 3, 1971, Ser. No. 139,415**

**Int. Cl. F16k *51/00*; F16l *23/00***

**U.S. Cl. 251—151** **5 Claims**



A valve structure comprising a swing-out body which is clamped between line flange connector plates by means of elongated studs with clamping nuts. Those studs which are located on, and on one side of, a diameter of the flow passages are provided with jacking nuts which may be tightened to engage the inside of the connector plates and separate them out of clamping engagement with the swing out body. A pair of hinge members welded to the swing out body have circular openings therein which rotatably receive bushings threadedably carried on one of the studs located on the aforementioned diameter. The studs without jacking nuts may be completely removed and the valve body may be pivoted out for internal inspection. Lateral slots in the hinge members permit removal of the valve body from the stud when the bushings are threaded back out of the circular openings in the hinges.

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**3,672,633**

**VENT VALVE**

**Thomas H. Engle, Cape Vincent, N.Y., assignor to General Signal Corporation**

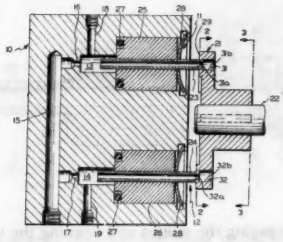
**Filed Sept. 14, 1970, Ser. No. 71,937**

**Int. Cl. F16k *11/02***

**U.S. Cl. 251—304** **3 Claims**

The disclosure concerns a sensitive vent valve for controlling the escape of air from a pressurized chamber. The

valve comprises a tubular seat, and a rotary plate which slides across one end of the seat and contains a through port which is selectively brought into registration with the seat. The port has



a short upstream portion and a longer and enlarged downstream portion so that the air which enters the port and expands therein will exert only minimal tangentially directed forces on the plate.

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**3,672,634**

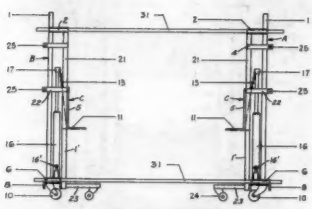
**LIFTING APPARATUS**

**Chester C. Chaffin, Missoula, Mont., assignor to Ezy-Way Manufacturing & Sales Co., Missoula, Mont.**

**Filed July 28, 1969, Ser. No. 846,308**

**Int. Cl. B60p *1/02, 1/28***

**U.S. Cl. 254—2 C** **4 Claims**



A load lifting and transporting apparatus comprises a pair of coacting units each having an upright main frame and a lifting or carriage frame. Hydraulic jacks on the two units of the apparatus raise and lower the carriage frame. The units have swiveled casters which may be locked in rigid positions. Ratchet controlled belts on the units are capable of encircling the load in two directions for safety and stability, and in another mode of use the two units may be rigidly coupled by connecting bars. The two units may be employed as a scaffold or table and a single unit of the apparatus is capable of forming a stable hand truck with load lifting capacity.

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**3,672,635**

**STAPLE REMOVER HOUSING MEANS**

**Whitney K. Munson, 28 Pinckney Road, and John N. Ricci, 22 De Forest Avenue, both of Red Bank, N.J., assignors to said Whitney K. Munson, by said Ricci**

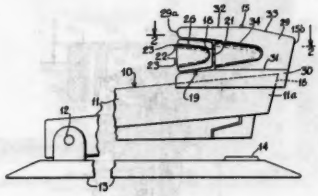
**Filed June 18, 1971, Ser. No. 151,001**

**Int. Cl. B25c *11/00***

**U.S. Cl. 254—28** **10 Claims**

A housing means for staple removers of the conventional spring actuated, pivotal jaw-type is provided for storing a staple remover when not in use in a generally horizontal position, with the jaws partially compressed and with all but the finger-piece portions of the staple remover housed within a recessed body, with engagement between said body and the compressed staple remover preventing accidental displacement thereof, while permitting free removal upon slight further compression of the staple remover.

Suitably the device is fashioned as two interfitting parts with top, side and end walls of the recess formed in the top part and the lower wall of the recess being formed by an interfitting protruding portion of the lower part of the assemblage. A single upper part of the assemblage can interfit with a plurality of



different lower parts, on which the lower surface is specially contoured to interfit with a predetermined support, with preferred adaptations including provisions for mounting of the device on stapling machines either in place of or in conjunction with the striking pads thereof.

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**3,672,636**

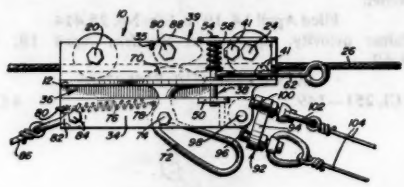
**CABLE GRIPPING TOWING DEVICE**

**Edward M. Parsen, Box 23, Miller, S. Dak.**

**Continuation-in-part of Ser. No. 861,615, Sept. 29, 1969. This application Nov. 20, 1970, Ser. No. 91,256**

**Int. Cl. E21c *29/16***

**U.S. Cl. 254—134.3 R** **14 Claims**



A cable tow device, adapted to ride on a messenger cable, is pulled along by a groundman's towrope or by a rope drawn by a vehicle. The device is provided with pivotally mounted means for securing a number of signal cables thereto. Releasable one-way locking means, in the form of mating cams, are mounted to the device and automatically clamp the device in place on the messenger cable whenever the towrope is slackened to prevent reverse movement. The pivotally mounted securing means yield when the towrope is released so as to prevent the device from being lifted off the messenger cable at the forward end.

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**3,672,637**

**RATCHET LEVER DRUM PULLER**

**Anthony G. Profet, Charlotte, N.C., assignor to Duff-Norton Company, Inc., Charlotte, N.C.**

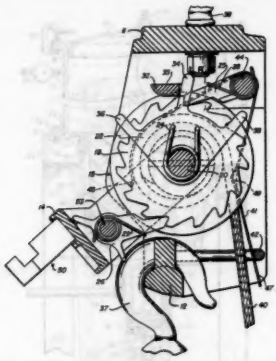
**Filed Jan. 14, 1970, Ser. No. 2,895**

**Int. Cl. B66d *1/00***

**U.S. Cl. 254—167** **12 Claims**

A ratchet lever drum puller having the ratchet toothed wheel integrally cast with the drum, and a reverse ring construction is disclosed. A retrofit or original equipment quick-lower mechanism works from the handle yoke and disengages the operating pawl to provide an arc of travel in the lowering configuration the same as raising. A cable guard is provided

from a single sheet of material which also assists in preserving the helical wind of the cable. The cable guard cooperates with



a cable guide to assist in securing the former, and to deter improper positioning of the dead-end hook on the cable guide.

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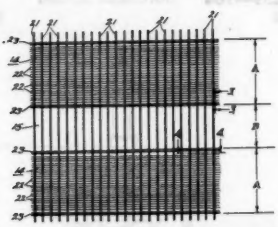
**3,672,638**
**SNOW FENCE**

William B. Krebs, Hanover, Pa., assignor to Keystone-Seneca Wire Cloth Company, Hanover, Pa.

Filed Feb. 3, 1971, Ser. No. 112,265
Int. Cl. E01f 7/02
U.S. Cl. 256—12.5 5 Claims



A snow fence made of a woven wire fabric in which the warp wires extend substantially parallel to the ground and the weft wires extend perpendicularly to the ground. The warp wires are arranged in groups which are spaced apart laterally so as to provide a series of vertically spaced horizontally extending slat structures providing a degree of resistance to the flow of wind without totally blocking the flow. The mesh of the slats is selected to permit limited wind flow therethrough and to permit coating of the woven fabric after weaving substantially without bridging of the coating material across the mesh openings.

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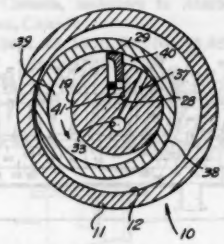
**3,672,639**
**ROTATING PNEUMATIC VIBRATOR**

Theodore S. Wadensten, 26 Snyder Ave., Ramsey, N.J.

Continuation-in-part of Ser. No. 42,791, June 2, 1970, Pat. No. 3,638,914. This application Oct. 9, 1970, Ser. No. 79,442
Int. Cl. B01f 11/00
U.S. Cl. 259—1 R 10 Claims

A rotating pneumatic vibrator in which a cylindrical housing is provided with an axial shaft spaced inwardly from the walls of the housing to provide a circular space between the shaft and the housing. A cylindrical rotor having a diameter greater than the shaft and smaller than the housing is mounted on the shaft for movement thereabout. A longitudinally extending radially moveable vane is mounted in the shaft and is arranged to be pneumatically pressed against the rotor. Air forces the vane against the rotor and escapes into the chamber formed between the shaft and the rotor. The air forces the



rotor to move about the shaft and then escapes to the atmosphere with the rotor and vane returned to their beginning point. The motion is continuous and produces vibrations due to the off center rotary movement of the rotor during which it strikes the shaft or both the shaft and housing.

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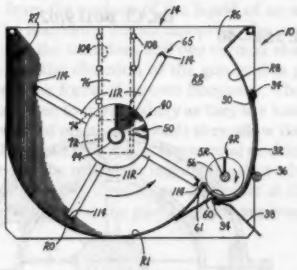
**3,672,640**
**MIXER**

Harvey L. Crose, P.O. Box 87, Tulare, Calif.

Filed Sept. 2, 1970, Ser. No. 69,048
Int. Cl. B01f 7/08
U.S. Cl. 259—6 18 Claims



A mixer particularly suited for use in mixing fluid materials, such as feed for livestock, characterized by a portable, elongated shell having an open top, for therein receiving materials to be mixed, a side discharge port, for discharging mixed materials, and a plurality of parallel augers adapted simultaneously to advance the materials in opposite directions for transporting and incidentally mixing the materials. A particular feature of the mixer resides in an agitator conforming to a rotatable paddle wheel operatively affixed to one of the augers, for mixing the materials received within the shell, adapted to avoid the effects of substantially immovable obstructions encountered by the agitator as it is driven in operative rotation.

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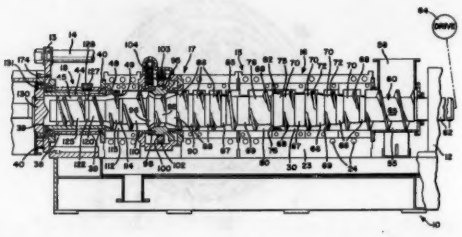
**3,672,641**
**APPARATUS FOR REMOVING LIQUIDS FROM ELASTOMERIC POLYMERS**

Robert Kent Slaby, Piqua, Ohio, assignor to The French Oil Mill Machinery Company, Piqua, Ohio

Continuation-in-part of Ser. No. 753,647, Aug. 19, 1968, Pat. No. 3,574,891. This application Sept. 14, 1970, Ser. No. 71,639
Int. Cl. B01f 7/08
U.S. Cl. 259—9 5 Claims

A continuous process and apparatus for removing liquids and/or vapors from elastomeric polymers causes the liquid containing polymer to undergo mechanical working and then a substantial reduction in pressure while contained within a

chamber having small vents to atmosphere or a collection housing. Essentially all of the last traces of liquids or vapors are removed in this chamber, the material is cooled by the vaporization of contained liquids, any resulting fine particles



are contained and immediately mixed into the material, and the material is subsequently discharged through an extruder section without further significant creating of fine particles in the end product as discharged.

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**3,672,642**

**MIXING APPARATUS FOR POWDERED NUCLEAR FUEL**

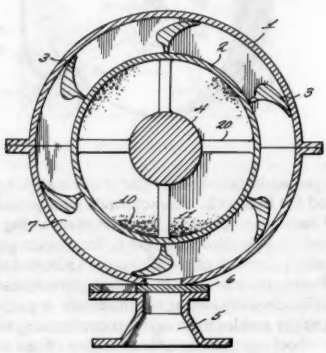
**Heinrich Beisswenger, Karlsruhe, Germany, assignor to Alkem Alpha-Chemie und-Metallurgie GmbH, Leopoldshafen, Germany**

**Filed Oct. 3, 1969, Ser. No. 863,573**

**Claims priority, application Germany, Oct. 5, 1968, P 18 01 414.7**

**Int. Cl. B01f *9/02***

**U.S. Cl. 259—50** **9 Claims**



An apparatus for mixing powdered nuclear fuel is provided in which the mixing space is in the form of a hollow cylinder whereby the inner diameter of the hollow cylinder is larger than half the outer diameter.

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**3,672,643**

**ELASTOMERIC PISTON**

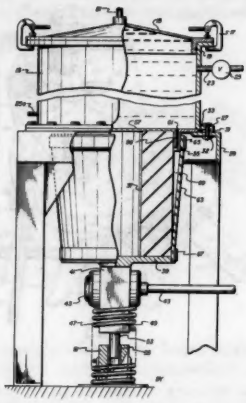
**Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif.**

**Continuation-in-part of Ser. No. 666,398, Sept. 8, 1967, Pat. No. 3,544,073. This application June 2, 1969, Ser. No. 829,488**

**Int. Cl. B06b *1/16, 1/20***

**U.S. Cl. 259—72** **4 Claims**

A device for radiating elastic pressure pulses into a liquid container which comprises a cylindrical body of elastomeric material, having connected to one end thereof an orbiting mass oscillator, with the opposite end covered by a plate being



affixed thereto, this end being further exposed to and in contact with a body of water contained within a tank.

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**3,672,644**

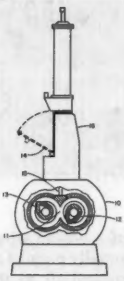
**ROTOR FOR INTENSIVE MIXERS**

**Arthur R. Crixell, Texas City, Tex., assignor to Monsanto Company, St. Louis, Mo.**

**Filed Dec. 5, 1969, Ser. No. 882,560**

**Int. Cl. B01f *7/00*; B29b *1/10***

**U.S. Cl. 259—104** **6 Claims**



An improved rotor for use in intensive mixers which reduces leakage of material out of the mixers comprising a substantially cylindrical body having affixed thereto a pair of diagonally disposed spiral lobes, said lobes terminating at the respective ends of the rotor at oppositely opposed end plate sections, the distance between the edges of the lobes adjacent the end face plate sections and the internal wall of the mixing chamber being greater than the distance between the edges of the lobes farthest from the end face plate sections and the internal wall of the mixing chamber.

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**3,672,645**

**CONTAINER AND STIRRER FOR PAINT SPRAYER**

**Joseph L. Terrels, 6 Greenbank Ave., and Robert Meneses, 1308 W. Chester Pike, both of West Chester, Pa.**

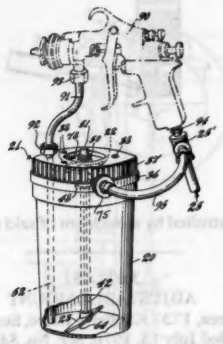
**Continuation-in-part of Ser. No. 772,559, Nov. 1, 1968, abandoned. This application Jan. 8, 1971, Ser. No. 105,003**

**Int. Cl. B01f *7/16***

**U.S. Cl. 259—122** **3 Claims**

A combination paint container and stirrer for use with a conventional spray gun. The stirrer is driven from the same

source of air that operates the spray gun. A vent system of the shaft keeps the air pressure within the cup at the proper level,



without allowing leakage of paint, even when the spray gun is positioned other than horizontally.

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**3,672,646**

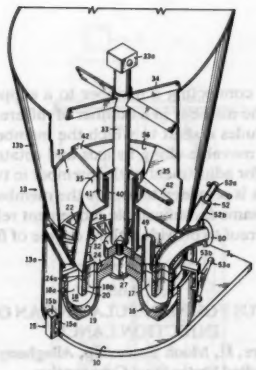
**PNEUMATIC CEMENT GUN MACHINE**

**James D. Burtin, Lebanon, Mo., assignor to Detroit Tool and Engineering Company, Lebanon, Mo.**

**Filed April 15, 1971, Ser. No. 134,190**

**Int. Cl. B28c 5/06**

**U.S. Cl. 259—151** **14 Claims**



A cement gun machine has a hopper subtended by a rotary transport bowl which is divided into radial compartments. The bowl receives dry cement mixture from the hopper, and moves it to a station where the mixture is pneumatically discharged into a delivery hose. A hood structure within the hopper traps cement dust and prevents it from escaping into the ambient atmosphere. Means are provided for introducing measured quantities of accelerator material into the cement mixture in the transport bowl.

**3,672,647**

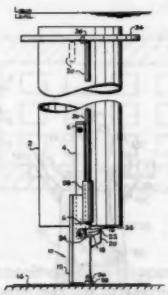
**QUICK RELEASE MECHANISM FOR SEWAGE LAGOON AERATION GUNS**

**Declan S. Murphy, and Rolland C. H. Charest, both of Montreal, Quebec, Canada, assignors to Atara Corporation, Montreal, Quebec, Canada**

**Filed Sept. 25, 1970, Ser. No. 75,652**

**Int. Cl. B01f 3/04**

**U.S. Cl. 261—121 R** **7 Claims**



An anchoring device is provided for an aeration gun which has two trunnions on it so that two men in a boat can release or replace a gun from the surface of the liquid of an aerated sewage lagoon. The anchoring device comprises the provision of two slots to accept the trunnions and two vertical elongated guide bars to control the direction of the gun as it is pushed downwardly against the force of its own buoyancy. The elongated guide bars are free to move axially as they are located in sleeves. In the retracted position (raised) they allow the trunnions to enter or leave the slots but in the normal position they are down and prevent the trunnions leaving the slots when the gun is in position. Preferably the slots are concyclic so that the trunnions may be held against the guide bars by applying twist to the gun.

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**3,672,648**

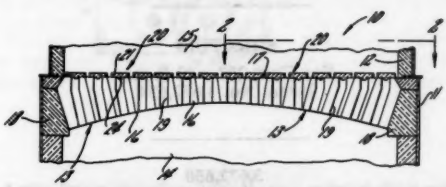
**TUYERE ASSEMBLY**

**Franklin Carr Price, 1125 Campbell Ave., Chicago Heights, Ill.**

**Filed Nov. 27, 1970, Ser. No. 93,274**

**Int. Cl. F27b 15/00**

**U.S. Cl. 263—21 A** **5 Claims**



A tuyere for controlling flow through a hole in a flat reactor hearth which utilizes the Bernoulli effect to retain its position. The tuyere is essentially a flat disc with a centering shaft fitting loosely in the hearth hole to prevent sideways movement. Either metal, including sheet metal, or refractory material can be used to form the tuyere, and it can be shaped to completely block backflow or with port grooves to increase gas volume flow.

**3,672,649**

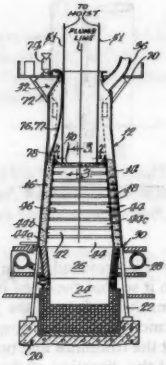
## SHAFT OR STACK FURNACE AND METHOD AND APPARATUS FOR LINING SAME

**John E. Allen, c/o J. E. Allen & Associates Inc., 173 W. Madison St., Chicago, Ill.**

**Continuation-in-part of Ser. No. 13,329, Feb. 24, 1970, Pat. No. 3,625,494. This application Sept. 11, 1970, Ser. No. 71,542**

**Int. Cl. F27d 1/16**

**U.S. Cl. 263—46** **22 Claims**



A stack portion of a furnace having an outer shell is lined with refractory concrete by casting or gunniting the concrete between the stack outer shell and a heat consumable inner form to build up the lining in horizontal layers of stacked integral rings in the absence of appreciable voids or vertical faults. The resulting lining is a monolithic refractory concrete wall capable of withstanding very high temperatures such as in blast furnace use. A suspended and vertically movable platform is provided for supporting ring-shaped form sections spaced inwardly from the furnace shell while the concrete is poured or gunnited from the platform at each pouring level. Laterally or horizontally extensible support members on the platform are used to bridge across the stack interior to provide interior support for the form during pouring.

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## ERRATUM

For Class 263—40 R see:
Patent No. 3,672,654

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**3,672,650**

## FURNACES

**Neil Clifford Ashdown, and Eugene Reginald Groutsch, both of Tasmania, Australia, assignors to Electrolytic Zinc Company of Australasia Limited, Melbourne, Victoria, Australia**

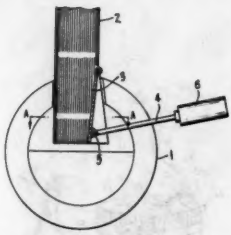
**Filed June 16, 1970, Ser. No. 46,742**

**Claims priority, application Australia, June 19, 1969, 56667/69**

**Int. Cl. F27b 9/38**

**U.S. Cl. 266—33 R** **4 Claims**

A feed chute for charging a metal melting furnace includes a member which is movable to vary the effective cross section of the chute, the rate of passage of feed material through the chute being controlled by movement of said member.



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**3,672,651**

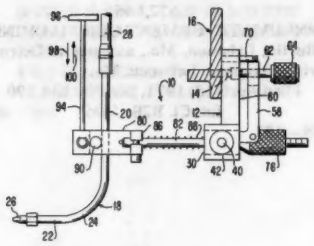
## ADJUSTABLE MOUNT

**John C. Diepeveen, 1737 Kimberly Drive, Sunnyvale, Calif.**

**Filed July 13, 1970, Ser. No. 54,179**

**Int. Cl. B23k 7/10**

**U.S. Cl. 266—23 F** **15 Claims**



A mount for connecting a member to a support to permit adjustment of the member in a number of different directions. The mount includes a shaft to which the member is coupled, the shaft being movable along its axis and rotatable about its axis to provide for adjustment of the member in two degrees of freedom. Means is provided to secure the member to the shaft laterally of the same for adjustable movement relative thereto transversely thereof to provide a third degree of freedom.

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**3,672,652**

## APPARATUS FOR MANIPULATING AN OXYGEN INJECTION LANCE

**Harry W. Schurr, II, Moon Township, Allegheny County, Pa., assignor to United States Steel Corporation**

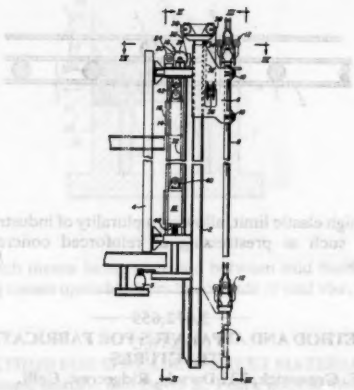
**Filed July 31, 1970, Ser. No. 60,051**

**Int. Cl. C21c 7/00**

**U.S. Cl. 266—34 LM** **3 Claims**

Hoisting mechanism for an oxygen lance includes a counterweighted lance carriage driven by a hoist system made up of a motor driven traction drum, guide sheaves and cables. The weight of the counterweight offsets the weight of the carriage, lance, hose complex attached to the lance, and skull build-up on the lance. In normal operation, the counterweight is elevated as carriage is lowered by the hoist system to insert the lance into an oxygen converter and conversely the counterweight is lowered when the carriage is raised by the hoist system to withdraw the lance from the converter. In the event there is a power failure which impairs operation of the hoist

system, the counterweight descends by gravity causing the carriage and lance to travel upwardly upon freeing the trac-



tion drum from restraint normally applied during the blowing operation of the converter.

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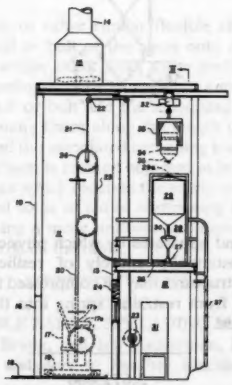
3,672,653

## INOCULATION APPARATUS

Everett W. Hale, Falconer; Paul H. Hawkinson, and Edward T. Robbeloth, both of Jamestown, all of N.Y., assignors to Blackstone Corporation

Filed Feb. 12, 1970, Ser. No. 10,879
Int. Cl. C21c 7/00
U.S. Cl. 266—34 T 2 Claims



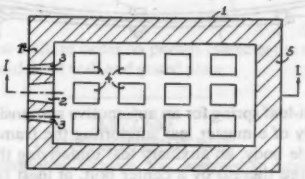
An apparatus is provided for injecting additives such as magnesium into molten metal so as to prevent the danger of flaring and flashing. The apparatus is a housing divided into two parts by a vertical wall, one part being totally enclosed and provided with a door through which a ladle of metal is introduced and a vertically movable nozzle adapted to enter the metal and the other part is provided with automatic injection apparatus and a control means therefor for delivering a preselected amount of additive at selected times.

3,672,654

## SOAKING PIT FURNACE

Rudiger Knaak, Neuss, Germany, assignor to Koppers-Wistra-Ofenbau Gesellschaft mit beschrankter Haftung, Dusseldorf, Germany

Filed Sept. 16, 1970, Ser. No. 72,772
Claims priority, application Germany, Sept. 19, 1969, P 19 47 391.7
Int. Cl. F27b 3/02
U.S. Cl. 263—40 R 13 Claims



A soaking pit furnace used for preparing metal ingots or blooms is provided with two sets of heating means, a principal burner means and an auxiliary burner means mounted in the upper portion of one wall of the furnace. The furnace also has an evacuating means in the lower portion of the same wall. The auxiliary heating means can supply only a minor portion of the heat requirement, but is capable of injecting hot gases into the furnace enclosure at a velocity of at least 70 meters per second.

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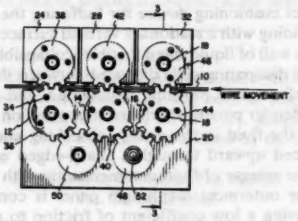
3,672,655

## WIRE FEEDER

Kenneth G. Carter, 175 Virginia St., Salt Lake City, Utah

Continuation-in-part of Ser. No. 755,336, Aug. 26, 1968, abandoned. This application March 12, 1970, Ser. No. 18,891
Int. Cl. B65h 17/20
U.S. Cl. 226—108 4 Claims



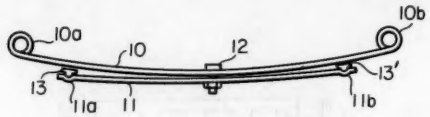
A wire feeder including a frame which supports three pairs of rotatably mounted drive rolls in a position to pass wire in a substantially straight line between the pairs of rolls and means connected to each of the rolls of each of said pairs of rolls for driving each of said rolls at the same speed. The drive rolls are grooved with sidewalls contacting at an angle of 100° to 150° and at least one drive roll in each pair of rolls can be provided with biasing means for urging the roll towards its coacting drive roll to impart a driving pressure to the wire between the pair of rolls.

3,672,656

## MULTI-LEAF SPRING FOR AUTOMOTIVE SUSPENSION

Kohichi Saitoh; Nobuo Ohkubo; Katsunobu Sobajima, and Takeshi Hirano, all of Yokohama, Japan, assignors to Nissan Motor Company, Limited and Nippon Hatsujo Company, Limited, Yokohama, Japan

Filed July 27, 1970, Ser. No. 58,513
Claims priority, application Japan, Aug. 1, 1969, 44/72655
Int. Cl. F16f 1/20
U.S. Cl. 267—47 1 Claim




A multi-leaf spring for an automotive suspension, consisting essentially of a master leaf supporting the frame structure of the vehicle body, an auxiliary leaf underlying the master leaf and secured thereto by a center bolt, at least two removable inserts interposed between those overlapping portions of the two leaves which are remote from the central portions of the leaves, and a central fixed inset interposed between and fixedly secured to the leaves, the spring thus constructed being adapted to eliminate practically all the modes of vibration and to be removed readily and economically when worn.

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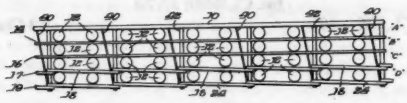
3,672,657

## LIQUID SHOCK ABSORBING BUFFER

Bruce O. Young; Grant W. Walker, both of Sacramento; Duane B. Ford, Placerville, and Wan Seegmiller, El Dorado, all of Calif., assignors to Energy Absorption Systems, Inc., Chicago, Ill.

Filed Sept. 23, 1970, Ser. No. 74,664
Int. Cl. E02b 3/22; F16f 5/00, 9/08
U.S. Cl. 267—116 8 Claims



An impact cushioning device for buffering the impact of a vehicle colliding with a stationary vertical surface. The device comprises a wall of liquid filled flexible, collapsible energy absorbing and dissipating cells disposed between the stationary vertical surface and movable articulated and overlapping diaphragm fender panels which are supported on slide plates. At impact, the fluid in the energy absorbing and dissipating cells is forced upward through a sharp-edged orifice which regulates the release of fluid commensurate with the force of impact. The outermost diaphragm panel is composed of a material having a low coefficient of friction to aid in safely redirecting the vehicle safely subsequent to impact.

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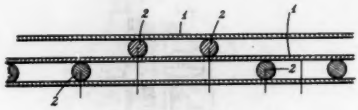
3,672,658

## SPRING-ACTION DEVICE

Pierre Habib, 2 rue Turgot, and Andre Puyo, 23, Boulevard du Montparnasse, both of Paris, France

Filed Nov. 28, 1969, Ser. No. 880,719
Claims priority, application France, Dec. 4, 1968, 68176505
Int. Cl. F16f 1/44
U.S. Cl. 267—160 12 Claims

A spring-action device comprising a stack of elastically deformable elements applied against each other and mounted between spaced supports which are disposed in sets of at least two, arranged substantially in staggered relation on each side of intermediate elements. This arrangement results in a composite spring having high mechanical properties and particularly a high elastic limit, allowing a plurality of industrial applications such as prestressing of reinforced concrete components.

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3,672,659

## METHOD AND APPARATUS FOR FABRICATING STRUCTURES

James E. Grasswick, 331 Dorado, Ridgecrest, Calif.

Filed March 2, 1970, Ser. No. 15,530
Int. Cl. F16f 1/14, 3/00; G05g 17/00
U.S. Cl. 267—182 6 Claims

A method and apparatus by which physical structures are fabricated substantially entirely of resilient members or modules. The structures may be compressed for shipment and, when released from restraint, spring into the final shape of structure desired.

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3,672,660

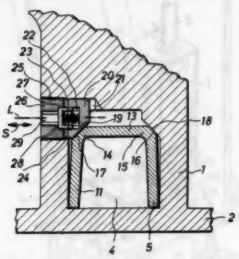
## PARALLEL VISE

Karl Jagob, Silschede, Germany, assignor to Paul Ferd. Peddinghaus, Gevelsberg, Germany

Filed June 11, 1970, Ser. No. 45,381
Claims priority, application Germany, June 11, 1969, P 19 29 488.3
Int. Cl. B25b 1/02, 1/24
U.S. Cl. 269—203 6 Claims

A parallel vise with a tunnel-shaped base portion in which a correspondingly shaped guiding rail carrying the movable jaw is displaceable, and in which said guiding rail has longitudinally extending inclined guiding surface means slidably en-

gaged by correspondingly inclined surface means of a spring-loaded bushing which is adjustable from the outside of the



vise, clutch means being provided between said bushing and adjusting means operable from the outside of said vise.

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**3,672,661**

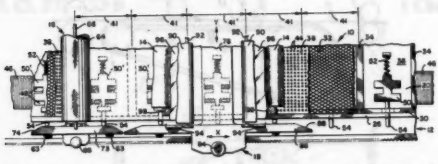
**METHOD FOR SPREADING SHEET MATERIAL**

**Heinz Joseph Gerber, and David R. Pearl, both of West Hartford, Conn., assignors to Gerber Garment Technology, East Hartford, Conn.**

**Division of Ser. No. 821,780, May 5, 1969, Pat. No. 3,495,492. This application Feb. 2, 1970, Ser. No. 7,545**

**Int. Cl. B65h *29/46***

**U.S. Cl. 270—31** **5 Claims**



Garment fabric or other similar flexible sheet material is spread from a roll or bolt of the same onto a table for subsequent cutting and/or other work to be performed thereon, and in such spreading may be spread into a multi-layer layup by passing the roll or bolt and the associated spreading tool back and forth many times along the length of the table. As the roll or bolt and the associated spreading tool move relative to the table a vacuum is created adjacent at least that portion of the table surface which receives the newly spread portion of the sheet material so as to aid in eliminating wrinkles and in otherwise achieving a more uniform and desireable arrangement of the material on the table.

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**3,672,662**

**TURNTABLE FABRIC SPREADING MACHINE**

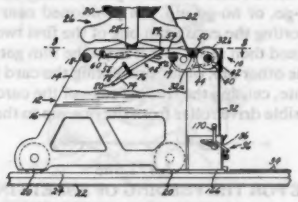
**Harold Grimm, Bronx, and Ira Zuckerman, Far Rockaway, both of N.Y., assignors to Panther Machine Corp., New York, N.Y.**

**Filed March 19, 1970, Ser. No. 21,047**

**Int. Cl. B65h *29/46***

**U.S. Cl. 270—31** **9 Claims**

In a turntable fabric spreading machine having a positive drive roller for drawing fabric off a supply roll and positively feeding it through a cutting assembly to a table surface, handle-actuated cam means mounts an idler roller for movement between an operative position in which it is in close promimity to the positive feed roller for causing the fabric to wrap around the latter, and a retracted position in which it is spaced a substantial distance from the feed roller to permit the fabric to be manually fed therebetween. Handle-actuated cam means are also provided to separate the front wall of the cutting assembly housing from a guard plate normally closely spaced



from said front wall, in order to permit fabric to be manually fed between said front wall and guard plate.

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**3,672,663**

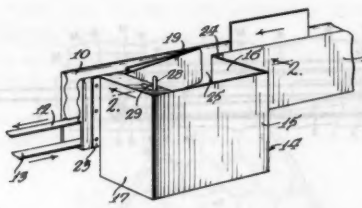
**CONVEYOR DROP BOX**

**Charles W. Tomlinson, Orange, Va., assignor to Acme Visible Records, Inc., Crozet, Va.**

**Filed Dec. 21, 1970, Ser. No. 100,280**

**Int. Cl. B65h *29/58***

**U.S. Cl. 271—64** **1 Claim**



The combination with a laterally confined belt conveyor for moving documents or the like of a receptacle having bottom end walls and side walls, one of the side walls having a pivotally mounted gate portion adapted to extend above the conveyor belt and between the side walls of the conveyor for gathering therefrom conveyed articles such as documents at one or more points on the conveyor, the hinged gate being either manually, mechanically or electrically actuated into and out of the path of articles conveyed on the belt.

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**3,672,664**

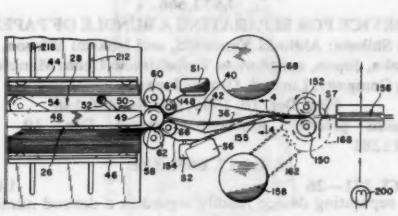
**REVERSIBLE BYPASSABLE APERTURE CARD READER**

**Louis J. Santirocco; Duane L. Rose, both of Rochester, and John W. Scofield, Pittsford, all of N.Y., assignors to The United States of America as represented by the Secretary of Commerce**

**Filed June 2, 1970, Ser. No. 42,650**

**Int. Cl. B65h *3/06***

**U.S. Cl. 271—3** **5 Claims**



A pair of parallel card hoppers are spaced from a projector film gate. A reversible drive roller and two idler pinch rollers,

defining two reversible, oppositely transporting nips, are positioned near the hoppers for transporting a card from either hopper and later delivering it to the other hopper. A second reversible drive roller and idler pinch roller, defining a third, reversible-go, or no-go nip, are positioned near the film gate for transporting the card from one of the first two nips into the film gate, and then retrieving it from the film gate and delivering it to the other nip, or for preventing the card from entering the film gate, causing the trailing edge of the card to follow the first reversible drive roller from the one nip to the other.

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**3,672,665**

## DEVICE FOR THE FEEDING OF SHEETS IN COPYING MACHINES OR THE LIKE

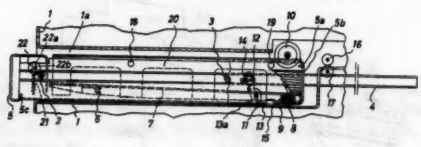
**Gunther Schnall, and Herbert Engel, both of Muenchen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany**

**Filed Nov. 9, 1970, Ser. No. 88,012**

**Claims priority, application Germany, Nov. 13, 1969, P 19 57 019.5**

**Int. Cl. B65h *3/06, 1/08***

**U.S. Cl. 271—39** **10 Claims**



A device for the feeding of stacked sheets in a copying machine or the like has a reciprocable drawer which is mounted in the frame of the machine and is movable between an inserted and an extended position. The drawer supports a platform which serves to support a stack of sheets and is pivotably mounted in the drawer. The front part of the platform can be depressed by hand and is then engaged by spring-biased detent levers which are provided on the drawer to hold the front part in a lower position during the placing of a fresh stack onto the platform in extended position of the carriage. A spring biases the front part upwardly and is free to urge the topmost sheet of a freshly inserted stack against an intermittently driven feeding roller, which is mounted in the frame, when the drawer is returned to its inserted position. During such inward movement of the drawer, stops which are provided in the frame disengage the levers from the front part so that the latter can pivot under the action of the spring.

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**3,672,666**

## DEVICE FOR SEPARATING A BUNDLE OF PAPER

**Seiya Shibata; Akitoshi Yamasaki, and Isokazu Shimon, all of Osaka, Japan, assignors to Tsubakimoto Chain Manufacturing Company, Limited, Osaka, Japan**

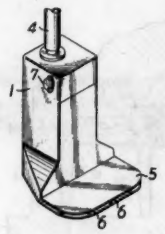
**Filed Dec. 18, 1969, Ser. No. 886,146**

**Claims priority, application Japan, Dec. 19, 1968, 43/111281**

**Int. Cl. B65h *3/08***

**U.S. Cl. 271—26** **1 Claim**

A separating device readily separates a desired number of sheets of paper in bundle form from a pile of paper sheets placed on a pallet or skid without disturbing the orderly piled-up bundle. The device comprises a nozzle made in a flat, palm-like form by which a compressed air is ejected into the boundary portion between the paper bundle and the paper pile and diffused uniformly over the entire area of the boundary portion to provide an air separation layer. The nozzle has guides for effecting diffusion of the compressed air.



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**3,672,667**

## APPARATUS FOR STAGGERING BLANKS OF SHEET MATERIAL

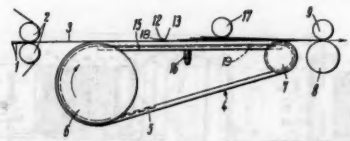
**Bruno Pahlitzsch, Gneisenaustrasse 67, 1 Berlin 61, Germany**

**Filed July 9, 1970, Ser. No. 53,553**

**Claims priority, application Germany, July 17, 1969, P 19 37 082.2**

**Int. Cl. B65h *29/24***

**U.S. Cl. 271—74** **4 Claims**



Blanks of sheet material, to be assembled in staggered relationship for the application of glue to overlapping flaps thereof, are horizontally fed at a relatively high speed to the upper run of an endless conveyor moving at the same speed and carrying at least one wedge-shaped cam in whose wake the blanks are entrained by suction toward a pair of exit rollers moving at a relatively low speed. The rear part of each blank, forming a flap, is thereby caused to ride up the inclined leading flank of the next oncoming cam, thus overlapping the front part of the next-following blank. The feeding of the blank to the exit rollers is facilitated by a transfer roller closely spaced from the upper conveyor surface so as to hold the raised flap down onto the cam.

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**3,672,668**

## LARGE-CAPACITY CARD SUPPLY MAGAZINES COMPRISING A DEVICE FOR RETAINING AND TRANSFERRING CARDS

**Gerben Jan Keulen, Amsterdam-Zuid, Netherlands, assignor to Bull General Electric (Nederland) N.V., Amsterdam, Continuation of Ser. No. 793,848, Jan. 24, 1969, abandoned.**

**This application Aug. 20, 1970, Ser. No. 65,675**

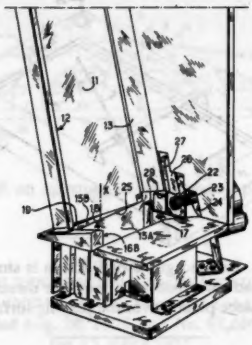
**Claims priority, application Netherlands, Feb. 2, 1968, 6801512**

**Int. Cl. B65h *1/06***

**U.S. Cl. 271—61** **10 Claims**

In a card supply magazine with a device for retaining and transferring cards, the walls of a loading ramp are turned angularly about a vertical axis relatively to the walls of a lower reception magazine. The cards situated at the bottom of a stack in the ramp rest on two support surfaces and on a rotatable roller. When the roller is driven in rotational movement by a motor, cards driven frictionally by the roller rotate about the

said axis and fall into the lower magazine from which they are extracted. A vibrator arranged at the bottom of the stack



facilitates the fall of the cards into the lower magazine. The motor is controlled by a device monitoring the level of the cards in the lower magazine.

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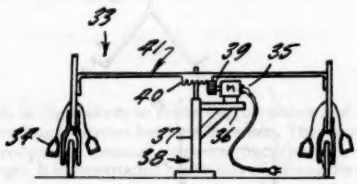
**3,672,669**

**ALTERNATIVELY OCCUPANT PROPELLED OR MOTOR DRIVEN ROUNDABOUT**

**John James Ottaviano, 113 Stark Ave., Penn Yan, N.Y.**

**Filed Feb. 8, 1971, Ser. No. 113,550**
**Int. Cl. A63g** *1/10, 1/12*
**U.S. Cl. 272—33 B** **1 Claim**



An amusement ride for children, the device comprising a stand that supports a horizontally rotatable frame consisting of a pair of crossing arms, each of the arms at its outer end being attached to a riding unit which consists of a horse-shaped body supported upon a front and rear wheel that travels on the ground, the front wheel having foot pedals and the horse shaped body having a seat for a rider. The foot pedals are removable and a pair of stirrups are releasable to hang down upon opposite sides of the horse-shaped body. An electric motor mounted on the stand has a gear engageable with a gear mounted on the underside of the hub supporting the crossing arms whereby the pedals may be removed and the roundabout motor driven.

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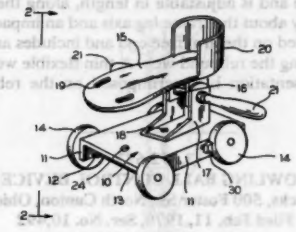
**3,672,670**

**WHEELED FOOT-EXERCISING DEVICE WITH HAND GRIPS**

**Ralph A. Burzenski, 5429 N. 25th St., Milwaukee, Wis.**

**Filed July 8, 1970, Ser. No. 53,117**
**Int. Cl. A63b** *23/04, 21/00*
**U.S. Cl. 272—79 R** **5 Claims**

A physical exercising device supported on wheels and having a pivoted upper platform for receiving the foot of a user. The upper platform is spring biased into a normal horizontal position. The exercising device has hand hold grips extending out from the side. These hand hold grips may be used by the exerciser in a push-pull manner on the floor so as to exercise



his arms. The upper platform may have an extended lever to aid in manually pivoting the upper platform.

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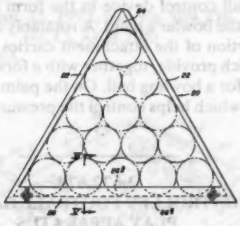
**3,672,671**

**BILLIARD BALL RACK**

**Anthony Merola, Pittsburgh, Pa., assignor to Amerola Products Corporation, Pittsburgh, Pa.**

**Filed June 22, 1970, Ser. No. 47,983**
**Int. Cl. A63d** *15/00*
**U.S. Cl. 273—22** **10 Claims**



A rack for shaping a group of billiard balls on a pool table, which rack has interconnected sides defining a patterned enclosure, such as a triangular or diamond shaped enclosure. At least one of the side members has an inclined interior surface which will serve to urge the balls into a compact pattern when a downward pressure is exerted on the rack.

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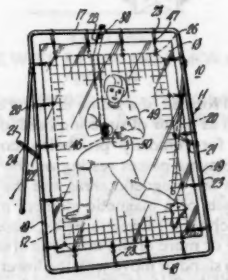
**3,672,672**

**BALL REBOUND DEVICE**

**Herbert Rubin, New York, N.Y., assignor to New York Toy Corporation, New York, N.Y.**

**Filed Jan. 20, 1971, Ser. No. 107,924**
**Int. Cl. A63b** *69/40*
**U.S. Cl. 273—26 A** **7 Claims**



A missile rebound recreational device includes a rectangular frame adjustably supported in an inclined position and sup-

porting a registering rebound net by peripherally spaced elastic bands interconnecting the frame legs and rebound net. A support arm depends from the frame top leg behind the rebound web and is adjustable in length, along the frame leg and angularly about the frame leg axis and an impact actuated bell is mounted on the arm free end and includes an actuating member facing the rebound web. A thin flexible web having a target representation is superimposed on the rebound web front face.

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**3,672,673**

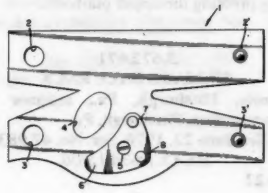
**BOWLING BALL CONTROL DEVICE**

**De Voe H. Hicks, 500 Foster St., North Canton, Ohio**

**Filed Feb. 11, 1970, Ser. No. 10,492**

**Int. Cl. A63b** *71/14*

**U.S. Cl. 273—54 B** **2 Claims**



Bowling ball control device in the form of a strap-type attachment to the bowler's hand. A rotatably adjustable plate on the main portion of the attachment carries a pair of upstanding posts which provide, together with a forward portion of the plate, a seat for a bowling ball. On the palm side of the strap is a palm plate which helps control the pressure of the ball on the hand.

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**3,672,674**

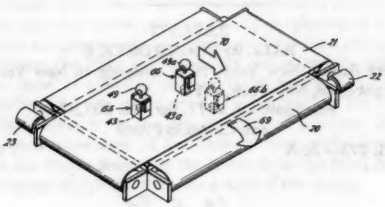
**REMOTE CONTROLLED FOOTBALL GAME WITH PASS PLAY APPARATUS**

**Donald L. Reed, 12415 Broken Arrow, Houston, Tex.**

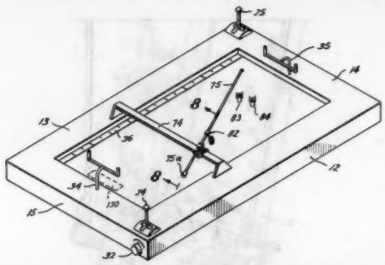
**Filed March 11, 1970, Ser. No. 18,513**

**Int. Cl. A63f** *7/06*

**U.S. Cl. 273—94 R** **10 Claims**



A game board formed of a frame defining a playing surface with means such as a pair of superimposed, diversely moving, flexible sheets for remotely producing controlled diverse movements of playing pieces resting on the playing surface. The lower sheet has magnetic areas and the game pieces incorporate magnets or a magnetic element movable between positions in which their magnetic fields, respectively, may interlink with one or more of the magnetic areas, thereby causing the pieces to stand or move with the lower sheet, and other positions in which their fields clear the magnetic areas whereby the game pieces will frictionally adhere to the upper sheet for standing or moving therewith, irrespective of the movement of the lower sheet. Controlled powering means is provided whereby the players may produce selected diverse movements of their respective game pieces in accordance with



the game rules. Related game ball action is simulated by the means of a bead on a rod with variable directional settings from a bridge piece placed over the playing surface.

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**3,672,675**

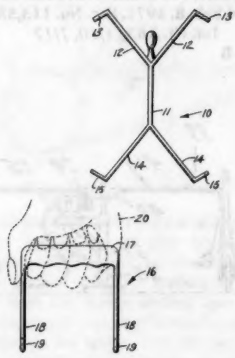
**HOOKED STICK FIGURE AND HANDLE FOR CATCHING AND PROJECTING SAME**

**Elias J. Morris, Jr., 5020 Good Drive, New Orleans, La.**

**Filed May 18, 1970, Ser. No. 38,397**

**Int. Cl. A63b** *63/00*

**U.S. Cl. 273—96 R** **1 Claim**



An exercise and amusement toy consisting of a handle portion and an animated figure portion. The handle portion is U-shaped for the user to grip with one hand and has hooks at the end of its leg members. The figure has hooked, stick-like appendages formed around its central stem. The handle portion is used to catch and toss the figure portion.

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**3,672,676**

**TETHERED BALL APPARATUS WITH CATAPULTS AND STATIONARY GOALS**

**Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif., and Rene Soriano, Los Angeles, Calif., assignors to said Goldfarb, by said Soriano**

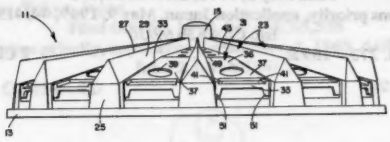
**Filed Dec. 14, 1970, Ser. No. 97,959**

**Int. Cl. A63b** *71/02*

**U.S. Cl. 273—101** **14 Claims**

A game comprising a playing board having a ball attached to a string extending from the center of the board. A plurality of individual flipper members are disposed about the center of the board, with each flipper member being capable of catapulting the ball attached to the strong off the surface of the flipper member toward another flipper member. Each

flipper member has an aperture therein capable of allowing the ball to pass therethrough, and each player attempts to flip



the ball through an aperture in an opposing player's flipper member.

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**3,672,677**
**FRANGIBLE IN FLIGHT ARROW HEAD COVER**
**Vern E. Moore, 4907 W. Havasu Way, Salt Lake City, Utah**
**Filed Aug. 20, 1970, Ser. No. 65,609**
**Int. Cl. F41b** *5/02*
**U.S. Cl. 273—106.5 R** **20 Claims**

A novel, in-flight cover to protect arrow points and archers during handling of arrows has been invented. The novel cover has an aerodynamic external shape and fractures upon impact with a target. It is constructed preferably of a frangible material and has a center opening to accommodate an arrow point and to frictionally secure itself thereto. The external surface is preferably conical in shape and may have vanes cut in the surface thereof to provide stability for arrow shafts in flight. Frangible cellular materials such as polystyrenes, polyurethanes and the like are useful construction materials. The novel covers of this invention may protect various types of points such as hunting points, field tips and the like. An insertion device for placing the cover on an arrow comprising a hard, rigid material having an internal opening having substantially the same shape as the external surface of the cover is also provided.

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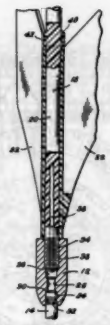
**3,672,678**
**DART CONSTRUCTION**
**Bartolo Rizzo, Providence, R.I., assignor to Hasbro Industries, Inc., Pawtucket, R.I.**
**Filed Nov. 3, 1970, Ser. No. 86,545**
**Int. Cl. A63b** *65/02*
**U.S. Cl. 273—106.5 R** **2 Claims**

A dart construction comprising a weighted head portion, a metallic shaft secured thereto and extending therefrom and terminating in a point, and a plastic shaft threadedly attached to the head portion and extending in an opposite direction from the metallic point in substantial alignment therewith, said plastic shaft having a tubular member slidably received thereon, said tubular member having a plurality of vanes extending integrally therefrom, and an integral collar on the plastic shaft for maintaining the tubular member snugly positioned between said collar and the head portion. The collar has a pair of diametrically opposed openings therein for



facilitating turning movement of the shaft when being threaded to the head.

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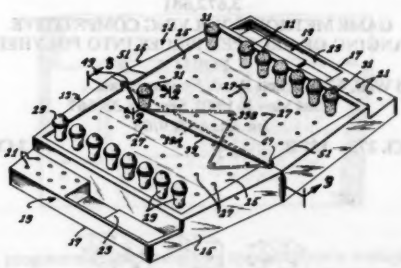
**3,672,679**
**MOVABLE BOUNDARY BOARD GAME APPARATUS**
**Edgar Burns, Los Angeles, Calif., assignor to Mattel, Inc., Hawthorne, Calif.**
**Filed Jan. 25, 1971, Ser. No. 109,270**
**Int. Cl. A63f** *3/00*
**U.S. Cl. 273—131 BA** **10 Claims**



A game board structure having a plurality of movable playing pieces disposed on each side of a movable boundary across the playing surface dividing it into two playing areas. The playing pieces include means for removably securing the pieces to the playing surface and means for contacting the movable boundary and moving at least that portion thereof so contacted to alter its shape and thereby change the dimensions of the playing areas.

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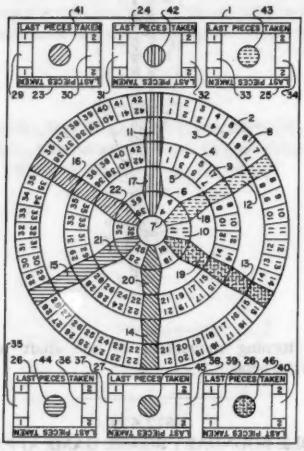
**3,672,680**
**BOARD GAME WITH DEFINITELY MOVABLE GAME PIECES**
**Joseph Michael Grey, 3060 Ruth St., Philadelphia, Pa.**
**Filed Sept. 9, 1969, Ser. No. 856,383**
**Int. Cl. A63f** *3/00*
**U.S. Cl. 273—131 AB** **6 Claims**

Briefly, in carrying out the objects of this invention, a game apparatus is provided which includes a game board containing six equally spaced concentric circular lines divided up into spaces symmetrically located within the circles. Some of the aforesaid spaces are colored and some are numbered. The aforesaid game board also contains six rectangular shaped sections outside the aforesaid circles for the purpose of tallying certain captures during the course of the game. There is also provided with my invention 42 flat rectangular shaped pieces

bearing numbers on only one surface, numbered consecutively from one to 42 inclusive. There is further provided a set of six pieces of a different shape than the aforesaid 42 rectangular flat pieces.




A thorough description of the colors of the pieces and the finer points of the game are given in the specification which follows.

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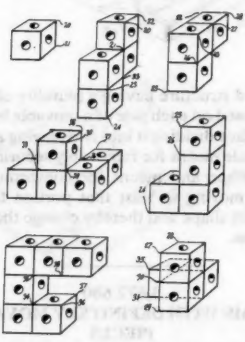
**3,672,681**

**GAME METHOD INVOLVING COMPETITIVE ARRANGING OF GROUPED PIECES INTO POLYHEDRIC FORM**

David Wolf, 67 Brackett Road, Newton, Mass.

Filed May 1, 1970, Ser. No. 33,667
Int. Cl. A63f 9/08
U.S. Cl. 273—157 R 2 Claims



A method of playing a game comprising two sets of pieces each set consists of twenty-seven cubes having a hole in each of its six faces. The cubes are interengageable to form building groups of two or more cubes. These groups are selectively constructed by opposing players in puzzle form as to permit the groups of each set to be assembled into a large cube. The groups of each set are exchanged by opposing players for purposes of competitively forming the cube from the opposing players building groups, thereby solving the puzzle.

**3,672,682**

**GOLF PUTTING TRAINING APPARATUS**

Sakan Yanagidaira, 25-10-2, Mita, Meguroku, Tokyo, Japan

Filed May 5, 1970, Ser. No. 34,670
Claims priority, application Japan, May 9, 1969, 44/41927
Int. Cl. A63b 69/36
U.S. Cl. 273—189 R 2 Claims

A golf putting practice aid device which helps to stabilize the golfer's arms during putting and to help him determine his best stable posture for putting. The device, in its simplest form, embodies an elongated strip or plate of lightweight wood, plastic or the like, and has at opposite end curved portions adapted to be interposed between and to engage snugly against portions of the golfer's arms. Another form includes a central casing having separate oppositely extended, slidable arm engaging stabilizing plates mounted adjustably within said central casing.

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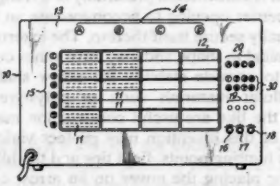
**3,672,683**

**TAPE PLAYER FOR PLAYING PLURALITY OF MAGNETIC TAPE CARTRIDGES**

Itsuki Ban, 829, Higashi-Otzumimachi, Nerima-ku, Tokyo-to, Japan

Filed March 20, 1970, Ser. No. 21,355
Int. Cl. G11b 23/10
U.S. Cl. 274—4 F 8 Claims

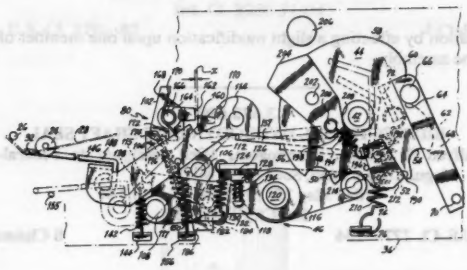


A tape player for playing a plurality of magnetic tape cartridges comprises a compartment adapted to vertically and horizontally receive a plurality of the magnetic tape cartridges, a deck provided with a reproduction means including a tape driving device for drivingly feeding the tape in the cartridge and at least one magnetic head adapted to transduce the tape, a horizontally movable mechanism for horizontally moving the deck, a laterally movable mechanism for laterally moving the deck, a lock for selectively locking the deck in the position where one cartridge is to be played, a shifting mechanism for moving the cartridge opposite to the deck retained by the lock means from the compartment toward the deck and for returnedly moving the cartridge from the playing position to the original position in the compartment, and an index mechanism for designating the cartridge to be played.

## 3,672,684
## MAGNETIC RECORDING AND REPRODUCING APPARATUS

Hiroshi Kawakami, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 30, 1970, Ser. No. 85,555
Claims priority, application Japan, Nov. 4, 1969, 44/88182
Int. Cl. G11b 5/00
U.S. Cl. 274—4 D 10 Claims



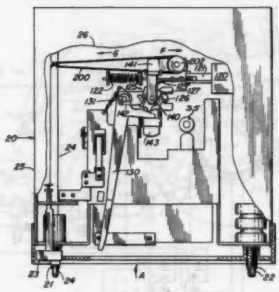
In a tape recording and/or reproducing device having a magnetic head for recording signals on and reproducing signals from a magnetic tape passing adjacent the head, in tension, from a supply reel to a takeup reel and switch control means movable to a plurality of positions for selectively determining the stop and operating modes of the device, apparatus is provided for selectively maintaining the switch control means in each of its positions. The apparatus includes means urging the switch control means to the position thereof which determines the stop mode of the device and a spring biased tape engaging lever pivotally mounted on the device for movement between first and second positions. The tape engaging lever is held in its first position by the tape as it is moved, in tension, past the magnetic head and is moved towards the second position by its spring in the absence of tensioned tape engaged therewith. A releasable locking mechanism, operably engaged between the switch control means and the tape engaging lever, holds the switch control means in a predetermined position corresponding to one of the operative modes of the device when the tape engaging lever is in its first position and for releasing the switch control means when the tape engaging lever is moved towards its second position whereby the device is automatically returned to its inoperative mode.

## 3,672,685
## UNIVERSAL CARTRIDGE-TYPE TAPE RECORDER AND PLAYBACK INSTRUMENT

James H. Tolar, Mayfield Heights, Ohio, assignor to Tenna Corporation

Filed Jan. 19, 1967, Ser. No. 610,346
Int. Cl. G11b 15/29, 21/08, 21/24
U.S. Cl. 274—4 G 6 Claims

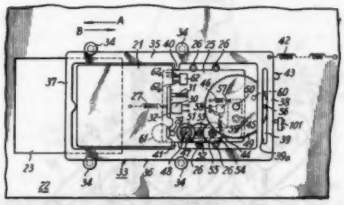
A cartridge-type tape player containing three coordinated systems for positioning the transducer with respect to the recording tracks on the tape. The first system is actuated by an operator controlled selector switch to index the transducer to a position adjacent the track or tracks containing the signals to be played. The second system automatically shifts the transducer 0.016 inches with respect to the tape when one type of cartridge which is normally loaded with a four-track prerecorded tape is inserted into the tape player. The third system has a mechanism for "fine tuning" the position of the transducer with respect to the tape by small increments to eliminate crosstalk and distortion caused by the failure of the transducer to come into perfect register with the tracks of the tape. Additionally the tape guide may be adjusted for perfecting the position of the tape with respect to the transducer.



## 3,672,686
## PROGRAMMED TRACK SELECTING APPARATUS

Itsuki Ban, 829, Higashi-Oizumimachi, Nerima-ku, Tokyo-to, Japan

Filed Oct. 6, 1969, Ser. No. 863,957
Claims priority, application Japan, Oct. 9, 1968, 43/73125; Jan. 22, 1969, 44/4060
Int. Cl. G11b 21/08
U.S. Cl. 274—4 A 5 Claims



A programmed track selecting apparatus for a multiple tape cartridge player utilizing a plurality of multi track endless magnetic tape cartridges includes a rotary cam for positioning a magnetic head to the desired track, a plurality of track selection switches for selecting a desired track, and a rotary switch rotatable in synchronism with the rotary cam and including switches corresponding to the track selection switches, rotation of the rotary cam being controlled by the track selecting switches and the rotary switch.

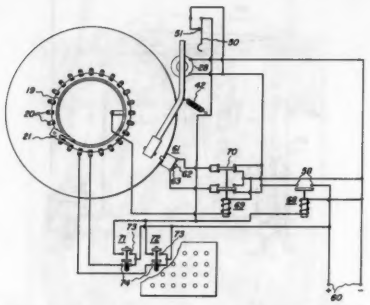
## 3,672,687
## AUDIO REPRODUCING APPARATUS FOR RANDOM ACCESS PLAYBACK SYSTEMS

David J. Ben Daniel, Schenectady; John O. Fielding, Ballston Lake, and Henry Hurwitz, Jr., Schenectady, all of N.Y., assignors to General Electric Company

Filed May 26, 1969, Ser. No. 827,792
Int. Cl. G11g 21/08; G11b 21/12
U.S. Cl. 274—9 RA 2 Claims

Audio playback apparatus is disclosed including a tone arm which is positioned electromagnetically to facilitate control thereof in accordance with the position of a turntable relative to the tone arm. The apparatus is particularly suited for random access retrieval of audio information from a record including a plurality of nested spirals each corresponding to items of information on a display or selection chart. An array of switches corresponding to individual items on the display

and a position selector switch assembly operated by the position of the turntable relative to the tone arm cooperate to



position the stylus of the tone arm in a spiral groove corresponding to the selected portion of the display.

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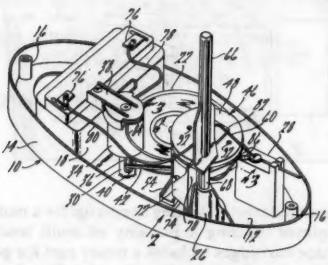
**3,672,688**
**TOY PHONOGRAPH**
**Charles P. Hill, Lorain, Ohio, assignor to The Leisure Group, Inc., Los Angeles, Calif.**
**Filed May 14, 1970, Ser. No. 37,084**
**Int. Cl. G11b** *17/06*
**U.S. Cl. 274—14** **3 Claims**



A toy phonograph having a rotary turntable, a pivoted tone arm carrying a sound box and a pick-up needle, a manually operated reset means engageable with the tone arm to return the arm to a starting position, and an electrically conductive spring member engaging the arm to urge the needle into engagement with the record and forming a part of the motor circuit to energize the motor during play of the record and to shut off the motor when play is completed.

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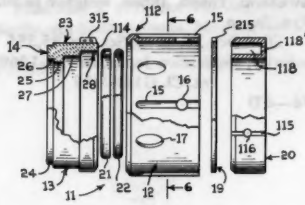
**3,672,689**
**MECHANICAL SEAL ASSEMBLIES**
**Robert C. Hadley, P.O. Box 4358, Odessa, Tex.**
**Filed Oct. 5, 1970, Ser. No. 77,793**
**Int. Cl. F16j** *15/34*
**U.S. Cl. 277—38** **10 Claims**

A shaft seal for effecting a seal between a wall member and a rotatable shaft which prevents flow of pressurized fluid from one to the other side of the wall. A seat is attached to the wall and presents a face to a rotating face of an improved sealing loaded seal assembly so as to present movable seal faces which sealingly engage one another as relative rotation occurs therebetween. A removable slipper sleeve enables the seal assembly to be used in either a balanced or an unbalanced appli-



cation by effecting a slight modification upon one member of the assembly.

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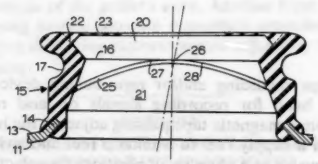
**3,672,690**
**BIDIRECTIONAL HYDRODYNAMIC SHAFT SEAL**
**Alfred S. Berens, Farmington, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.**
**Filed May 25, 1970, Ser. No. 40,144**
**Int. Cl. F16j** *15/32*
**U.S. Cl. 277—134** **8 Claims**



A shaft seal of the bidirectional hydrodynamic type with flutes that meet the sealing band or lip edge tangentially, the flutes being continuous and providing for hydrodynamic return of oil that has leaked past the lip edge. The continuous flutes are readily and accurately provided during molding in a seal having an as-molded lip edge.

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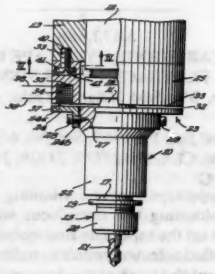
**3,672,691**
**MEANS FOR OPERATING RELEASABLE TOOL CHUCKS**
**Earl J. Hammond, Frankenmuth, Mich., assignor to Houdaille Industries, Inc., Buffalo, N.Y.**
**Filed June 2, 1970, Ser. No. 42,766**
**Int. Cl. B23b** *29/12, 31/28, 31/30*
**U.S. Cl. 279—1 TS** **13 Claims**



A tool holder or chuck of the type which is releasable from a tool by relative rotation of a releasing member is adapted to be selectively coupled with a non-rotating member while the tool driving spindle continues rotating uninterruptedly,

thereby releasing the clutch coupling to release the tool. Especially suitable for multi-operation machines, whereby various tools can be cyclically picked up from and returned to a rack in automatic operation of the machine to perform sequentially on a work piece.

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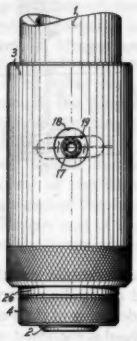
**3,672,692**

## QUICK-CHANGE CHUCKS

**Otto Fauth, Nellingen, Germany, assignor to Otto Bilz, Werkzeugfabrik, Vogelsangstr., Nellingen, Germany**

**Filed May 18, 1970, Ser. No. 38,080**
**Int. Cl. B23b *31/04***
**U.S. Cl. 279—82** **4 Claims**



A quick-change chuck with a hollow shank, a guide sleeve surrounding the shank, a tool-holding socket removably inserted into the shank and adapted to be adjusted to different positions in the axial direction of the shank by an adjusting nut on the end of the socket which is releasably connected in the adjusted position to the shank by locking balls which are guided in transverse bores in a reduced neck portion of the guide sleeve and are adapted to be moved into and out of an annular groove in the adjusting unit by a spring-biased control sleeve. For locking the guide sleeve and thus also the adjusting nut and the tool socket to the shank, the guide sleeve is provided with a peripherally extending slot through which a setscrew passes which is screwed into the shank. The axis of this slot is slightly inclined relative to a plane extending vertically to the axis of the guide sleeve so that, when the sleeve is turned relative to the setscrew in the slot, the sleeve is retracted on the shank until its neck portion abuts tightly against the front end of the shank.

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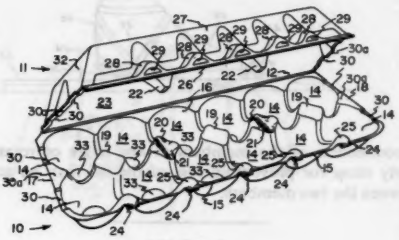
**3,672,693**

## EGG CARTON

**Dennis Douglas Weir, 1637 South 740 East, Orem, Utah**

**Filed July 11, 1969, Ser. No. 840,934**
**Int. Cl. B65d *85/32***
**U.S. Cl. 229—44 R** **1 Claim**

An egg carton fabricated of plastic and shaped to cradle and cushion eggs of varying size. A single motion closing latch is provided, the lid is supported against crushing and is held against wracking and an enlarged flat surface is provided on



the lid to insure adequate marking space. Ventilation is provided through matched slots formed in the base and cover.

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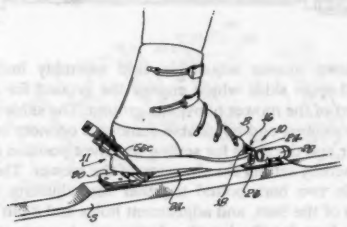
**3,672,694**

## MEANS AND TECHNIQUES FOR RELEASABLY SECURING SKI BOOTS TO SKIS

**William R. Whittaker, Beverly Hills, Calif., assignor to Whittaker Corporation**

**Filed Dec. 21, 1970, Ser. No. 100,037**
**Int. Cl. A63c**
**U.S. Cl. 280—11.35 K** **10 Claims**



Ski bindings involve an attachment to the toe portion of a ski boot in the nature of a cam socket which is releasably engageable with a spring-urged plunger on a ski. Such plunger presses such boot attachment into releasable engagement with a forward end of an elongated plate which has a length commensurate to the length of a boot and which mounts a cam block on its rearwardmost portion. Such cam block is normally received within an adjustable abutment mounted on the ski. The plate carries a spring-urged stirrup having a portion engageable with the top portion of the boot heel to normally press the boot into engagement with the plate. When abnormal forces are developed, as in mishaps, the boot is released from the ski, depending upon the direction of the force, either at the toe portion or at the spring-urged stirrup. This automatic release at the stirrup is preadjusted using an adjustable screw.

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**3,672,695**

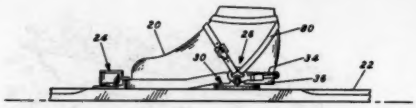
## SAFETY TURNTABLE FOR A SKI BINDING

**Ernest Peter Baukhage, 180 Edgewood Ave., Mill Valley, Calif.**

**Filed Nov. 20, 1962, Ser. No. 238,918**
**Int. Cl. A63c *9/082***
**U.S. Cl. 280—11.35 K** **10 Claims**

A safety turntable for a ski binding includes a member fixed to a ski and another member adapted to be attached to a ski with one of the members being cylindrical and the other member having a cylindrical recess for receiving the cylindrical member. The cylindrical portion of one of the members is provided with a circularly extending groove and the other

member is provided with movable detent means allowing the two members to rotate relative to one another but permitting




disconnection of the members at any angle of rotation. A safety strap for preventing loss of the ski may be attached between the two members.

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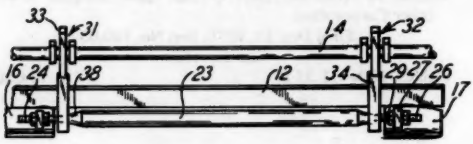
3,672,696

## LAWN MOWER ADJUSTABLE SKID ASSEMBLY

Sahag C. Akgulian, and Donald G. Haffner, both of Racine, Wis., assignors to Jacobsen Manufacturing Company, Racine, Wis.

Filed May 15, 1970, Ser. No. 37,664
Int. Cl. B62b 13/06
U.S. Cl. 280—15 7 Claims




A lawn mower adjustable skid assembly including two spaced-apart skids which engage the ground for elevational support of the mower above the ground. The skids are pivoted to the mower, and adjustable standards connect between the mower and the skids for setting the pivot position of the skids and thereby setting the elevation of the mower. The standards include two bars bolted together for adjusting the overall length of the bars, and adjustment holes and a pin are related to the bars for the length adjustment. A connector extends between the two spaced-apart skids, and the connector is attached between the skids to serve as an anti-scalping bar which extends across the mower at a level above that of the skids so the mower is stable on the skids.

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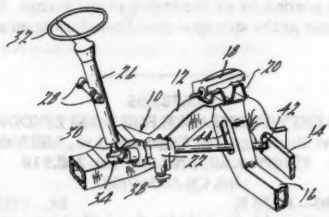
3,672,697

## MOTOR VEHICLE STEERING SYSTEM

James Knowles, Bloomfield Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed July 6, 1970, Ser. No. 52,306
Int. Cl. B62d 1/18, 1/20
U.S. Cl. 280—87 A 11 Claims




A steering system for a motor vehicle having a steering column and a steering gear. The column is supported, in part, by a bracket situated between the vehicle's fire wall and instrument panel. The column is also supported by the steering gear which, in turn, is secured by frangible means to the chassis frame. In the event of an impact load causing the collapse of the front vehicle structure, the gear separates from the frame and the column swings about its support on the bracket thereby causing the steering wheel to move away from its normal operating position.

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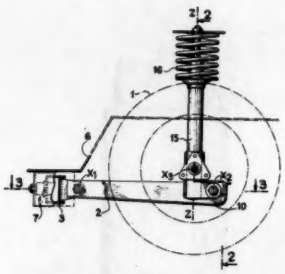
3,672,698

## REARWHEEL UNIT OF A VEHICLE HAVING INDEPENDENT WHEELS AND TRAILING LINKS

Armand P. Froumajou, Pontoise, France, assignor to Automobiles Peugeot, Paris and Regie Nationale Des Usines Renault, Billancourt, France

Filed Aug. 25, 1970, Ser. No. 66,680
Claims priority, application France, Oct. 30, 1969, 6937292
Int. Cl. B60g 11/56
U.S. Cl. 280—124 A 5 Claims




Rear wheel unit of an automobile vehicle comprising independent wheels mounted on trailing suspension links which are pivoted to the suspended part of the vehicle to pivot about a transverse axis. Each wheel is mounted on a stub-axle which is integral with an axle support connected to the suspension link through a resiliently yieldable pivot device.

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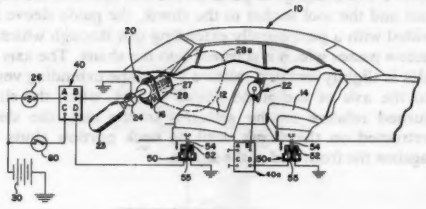
3,672,699

## AUTOMATIC RESTRAINT SYSTEM ARMING CONTROL

Edward Mandell De Windt, Lyndhurst, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed July 13, 1970, Ser. No. 54,353
Int. Cl. B60r 21/10
U.S. Cl. 280—150 AB 7 Claims

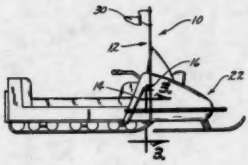



An occupant restraint mechanism which is mounted in a vehicle and automatically operable for restraining movement of the occupant relative to the vehicle in response to the vehicle being involved in a collision, including means for detecting the presence of an occupant and means for preventing operation of the restraint mechanism if no occupant is present to be restrained thereby.

## 3,672,700
## SNOWMOBILE DEVICE

Glen Edward Marose, Des Moines, Iowa, assignor to Snowmobile, Ltd., Des Moines, Iowa

Filed Jan. 28, 1971, Ser. No. 110,387
Int. Cl. B60r 27/00
U.S. Cl. 280—150 R 10 Claims

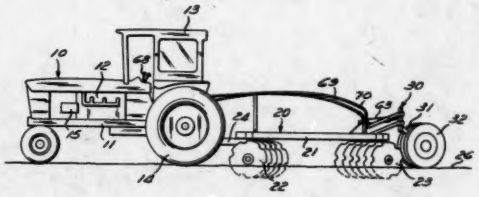


The snowmobile device is adapted to be mounted on a snowmobile and includes a vertically disposed first member and an obliquely disposed second member secured at its upper end to the first member at a point intermediate the opposite ends of the first member. Hinges are mounted on the lower ends of the first and second members and are rigidly secured to the snowmobile. The lower ends of the first and second members extend through the hinges and are provided with nuts on opposite ends of the hinges which are turnable for tightening against the hinges so as to prevent swinging movement of the first and second members with respect to the hinges. Modified forms of the device may include a light mounted at the upper end of the first member, a flat or pennant mounted at the upper end of the first member, and insulating means between the hinges and the snowmobile.

## 3,672,701
## TRAILING WHEEL STRUCTURE FOR VEHICLE-DRAWN IMPLEMENT

Wilbur L. Blank, 524 E. Jefferson St., Toulon, Ill.

Filed Aug. 20, 1970, Ser. No. 65,376
Int. Cl. B60g 1/00
U.S. Cl. 280—414.5 5 Claims



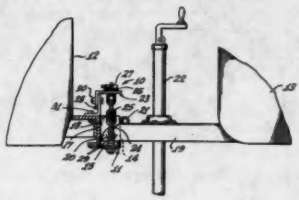
A tractor having a hydraulic pump is hitched to a disc harrow to be pulled over a field along a center line of travel. A ground wheel carriage is connected to the disc harrow at the center of travel. The connection between the disc harrow and the ground wheel carriage includes upper and lower links and a double acting hydraulic cylinder to raise and lower the disc harrow with respect to the ground.

## 3,672,702
## SAFETY HITCH DEVICE

Wilbur H. Phegley, Lone Pine, Calif., assignor to Howard L. Miller, Lone Pine, Calif., a part interest

Filed June 18, 1970, Ser. No. 47,417
Int. Cl. B60d 1/12
U.S. Cl. 280—457 15 Claims

A safety chain arrangement combined with a conventional ball hitch and including a bracket mounted on the towing vehicle in overhanging relation with the ball hitch, a connector welded to the tongue of the towed vehicle over the ball

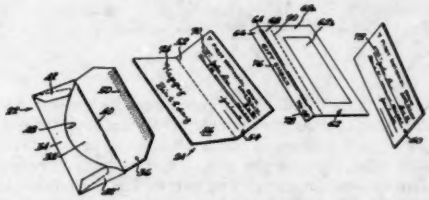


socket, and a safety chain extending between the connector and the bracket and detachably fastened to the latter.

## 3,672,703
## GIFT CHECK TRANSACTION FORM

Edward William Jay, P.O. Box 791, Coral Gables, Fla.

Filed Nov. 16, 1970, Ser. No. 89,613
Int. Cl. B41l 1/20; B42d 15/00
U.S. Cl. 282—25 9 Claims



A one-piece sheet paper form of elongate generally rectangular configuration, having fold-tear lines demarcating the form into a gift check section, an envelope section, a record section and an identifying section. The transaction form is adapted to be accordion folded in flat multi-thickness compact configuration for retail vending or the like. A vendor of the transaction form may fill out the amount only of a gift check blank imprinted on a fold panel of the gift check section, forming simultaneously a carbon copy on a check blank panel of the record section. The vendor may then separate the gift check section with the envelope section from record section, the latter of which he keeps. The vendee will then place the check section in the envelope section for mailing or delivery to a recipient, after filling in the remaining blanks and separating the check section from the envelope section. The recipient separates greeting area from check before cashing or depositing.

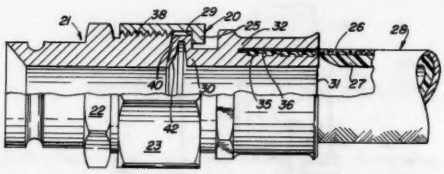
## 3,672,704
## LIP-SEAL FITTING

Roger D. Christianson, Springfield, Mass., assignor to Titeflex, a Division of Atlas Corporation, Springfield, Mass.

Filed April 17, 1970, Ser. No. 29,557
Int. Cl. F16l 19/00, 33/20
U.S. Cl. 285—110 13 Claims

The invention provides a gas-tight end-fitting for either a flexible hose or a rigid tubing of the type used in aircraft. To

make a metal-to-metal seal one end of the fitting is a concave annular flange plate which deflects to form a seal at two points.

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**3,672,705**

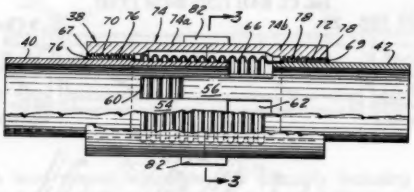
**PIPE JACK**

**Harold F. Rush, Bellflower, Calif., assignor to Garren Corporation, Huntington Beach, Calif.**

**Filed June 19, 1970, Ser. No. 47,815**

**Int. Cl. F16l 35/00**

**U.S. Cl. 285—39** **10 Claims**




A pipe jack for installation in pipe lines adjacent to a piece of equipment, such as, for example, a valve or pump, in order to remove said equipment when it needs to be serviced or replaced. End parts of the jack are threadably connected together by a center member or sleeve. The threads are left and right hand threads so that, as the center member or sleeve is rotated in one direction, the end parts are moved inwardly so that the jack contracts or is shortened and, when the sleeve is rotated in the opposite direction, the end parts are moved outwardly away from each other to lengthen the jack. Thus, a piece of equipment adjacent the jack may be removed when the jack is contracted and, when the serviced or replacement piece of equipment has been replaced, the jack is expanded to tightly and sealingly secure the piece of equipment in place. The inner ends of the end parts are provided with fingers which interlock with each other, but which are adapted to slide longitudinally relative to each other to prevent the end parts from rotating relative to each other when the jack is being shortened or lengthened. A piece of laminated, corrugated flexible tubing or sleeve is placed over the fingers and welded, or otherwise suitably secured to the end parts outwardly of the roots or outer ends of the fingers, to provide a sealing connection between the end parts.

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**3,672,706**

**MOUNTING MEANS**

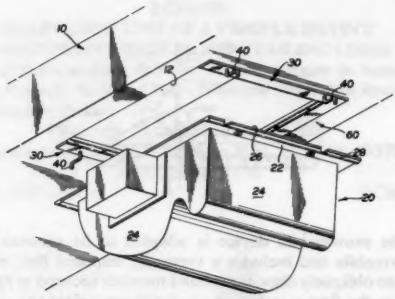
**Kermit E. Chilcoat, North Olmsted, Ohio, assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Jan. 26, 1970, Ser. No. 5,847**

**Int. Cl. F16l 5/00**

**U.S. Cl. 285—189** **11 Claims**

Means for mounting a body, such as a furnace humidifier to a thin wall, such as the wall of a warm air duct in registry with an opening therein. In particular, this invention relates to a means which requires no metal working or hole making other than providing an opening in the wall. The mounting means is a multipiece frame which is adapted to pressingly engage the wall at the edges defining the opening therein. Several of the brackets which make up the frame are equipped with one or more rotatable clamps which may be moved to a body holding or body releasing position. The clamps, when in body holding position, engage the body and press it to the duct. When in body releasing position, the clamps disengage the body and allow it to come free of the duct. Thus, the body can easily and quickly be mounted or dismounted without the use of tools or removal of screws.

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**3,672,707**

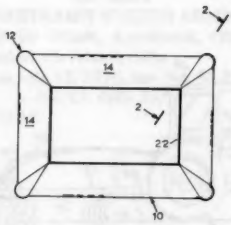
**EXPANSION JOINT**

**Carmela Mary Russo, and Baladassare Russo, Jr., both of 16608 Marine View Drive S.W., Seattle, Wash.**

**Filed Jan. 2, 1970, Ser. No. 188**

**Int. Cl. F16l 51/02**

**U.S. Cl. 285—229** **8 Claims**




An expansion joint is provided whereby any amount of expansion required can be absorbed with one fold only. Designed to be safe for expansion joint failures by eliminating stresses concentration at the corners and to be simple to manufacture and construction assembly.

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**3,672,708**

**COUPLING DEVICE**

**William L. Zemberry, Swissvale Borough, Pa., assignor to United States Steel Corporation**

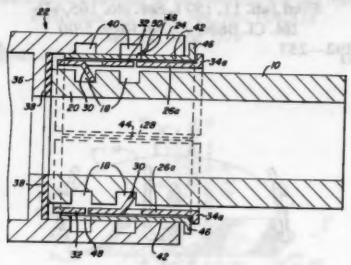
**Filed June 29, 1970, Ser. No. 50,622**

**Int. Cl. F16l 37/18**

**U.S. Cl. 285—315** **13 Claims**

A coupling device is disclosed for connecting one end of a pipe with a coupling member. The pipe is provided with pipe grooves adjacent said one end. The coupling member is provided with a coupling groove. A lock sleeve has a pipe groove tab and a coupling groove tab and is insertable into the

coupling member so that the coupling groove tab locks in the coupling groove and is disposable on the one end of the pipe



so that the pipe groove tab locks in the pipe groove thereby securing the coupling member to the one end of the pipe.

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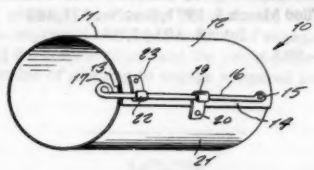
**3,672,709**
**TIME SAVER DRAWUP COLLAR**
**William N. Mueller, 342 S. Washington Ave., Fredericksburg, Iowa**
**Filed Feb. 1, 1971, Ser. No. 111,478**
**Int. Cl. F16l *21/00***
**U.S. Cl. 285—419** **2 Claims**



A collar that serves as a union for being fitted over the adjacent ends of pipes, the device including a flat sheet of metal which is rolled over to form a cylindrically shaped sleeve with the opposite end edges overlapping each other, and the end edges each having a hook in opposing directions so to hold against opposite sides of one end of a bar that is pivotable about its other end thus forming a quick securement of the end edges.

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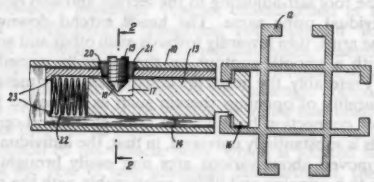
**3,672,710**
**COUPLING FOR CONNECTING TOGETHER BUILDING UNITS**
**Karl-Gunnar Kroopp, Farsta, Sweden, assignor to Grafiset System AB, Bandhagen, Sweden**
**Filed Dec. 14, 1970, Ser. No. 97,888**
**Claims priority, application Sweden, Dec. 19, 1969, 17599/69**
**Int. Cl. F16b *7/00***
**U.S. Cl. 287—56** **2 Claims**



As described herein, a coupling member for building units includes a ram member which is movably mounted within one of the building units and which has an end adapted for placement within the open end portion of the other building unit. The ram member is provided with a surface in the form of two sloping planes arranged at right angles to each other and obliquely positioned in the longitudinal direction of the ram member. Also provided is a screw member which is adapted to abut either of the sloping planes of the ram member to thereby effectively lock the ram member in either of two positions. The other end of the screw member is adapted to project into a hole arranged in the building unit.

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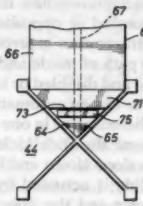
**3,672,711**
**STRUCTURAL COLUMN AND CONSTRUCTION**
**David D. Red, P.O. Box 6721, Houston, Tex.**
**Filed Feb. 12, 1969, Ser. No. 798,706**
**Int. Cl. F16b *1/00***
**U.S. Cl. 287—189.36 R** **5 Claims**



An X-shaped column, having beads at the end of the column webs, has a uniform strength in all directions in a cross-sectional plane. The beads are dimensioned such that they do not interfere with the mating of the surface presented by intersecting surfaces of two adjacent column webs and one end of a beam shaped to conform to such surfaces.

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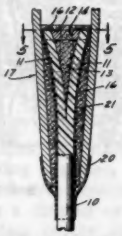
**3,672,712**
**STRUCTURE FOR CONNECTING ATTACHMENTS TO FIBERGLASS RODS**
**Elbert Davis, 1611 Glenmont Drive, Glendale, Calif.**
**Division of Ser. No. 835,135, June 20, 1969. This application July 6, 1970, Ser. No. 52,502**
**Int. Cl. F16b *7/02***
**U.S. Cl. 287—20.2 R** **6 Claims**



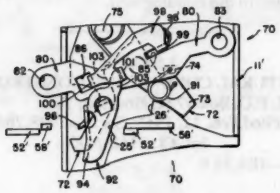
A structure for connecting an attachment to the end of a fiberglass rod, tube or other profile. The rod is separated into a plurality of segments which are held apart from each other by a spacer-spreader. A plug is disposed within the interior of the separated segments, preferably being cast in place. A cavity is formed around the exterior of the segments, also preferably being cast in place. Means forming a slip plane is provided between the exterior of the segments and the cavity so that upon the application of longitudinal tension to the rod, the segments and plug will move longitudinally within the cavity to convert such tension into lateral compression which transfers the load across the entire cross-section of the rod.

3,672,713

## AUTOMOBILE DOOR LOCK

Joseph Pickles, Bloomfield Hills, Mich., assignor to Ferro Manufacturing Corporation, Detroit, Mich.

Filed April 23, 1969, Ser. No. 824,350
Int. Cl. E05c 3/26
U.S. Cl. 292—216 37 Claims



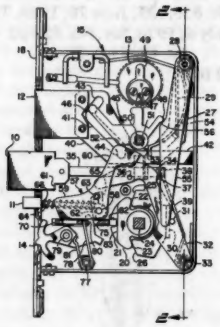
A locking lever is pivoted intermediate its length on a door-carried mount, being operated at opposite ends by internal and external linkages. A transmitter is pivoted on the lever to depend into or out of the path of inside and outside operators in the respective unlocked and disabled or locked condition of the lock. The locking lever has an automatic locking kick-off and reset slide mounted thereon; and in one position of its sliding adjustment on the lever the slide kicks the lever to unlocked position when the door closes and latches. In another position, to which the slide is actuated by an operator, the slide fails to kick the lever and the door latches shut in a locked condition.

3,672,714

## MORTISE LOCK WITH MULTIPLE FUNCTIONS

Jerald Schultz, Woodmere, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sept. 28, 1970, Ser. No. 75,862
Int. Cl. E05b 59/00
U.S. Cl. 292—34 19 Claims



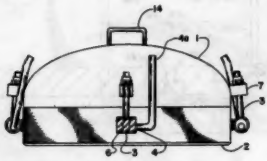
A deadbolt operating tumbler when rotated rearwardly beyond deadbolt retracting position will move a lever so as to operate a latchbolt retracting lever. There is a deadlatching dog coacting with both the latchbolt retracting lever and the dead-bolt tumbler. The retracting lever will move the dog to undog the latchbolt while also moving the tumbler to deadbolt retracting position. A stopwork slide is spring pressed at all times toward position locking an outside knob operated hub that moves the latchbolt retracting lever. The stopwork slide may be moved to release position by pressure of an inside hub, a lever actuated by the deadbolt tumbler, or by other parts that may be assembled. Slight reforming or reassembly of parts will permit the many lock functions that must be offered the market.

3,672,715

## QUICK OPENING CLOSURE CAP

Forrest L. Carson, Borger, Tex., assignor to J. M. Huber Corporation, Locust, N.J.

Filed Jan. 11, 1971, Ser. No. 105,444
Int. Cl. B65d 45/30; E05c 5/00
U.S. Cl. 292—257 5 Claims



A quick opening closure cap for pipelines, tanks, vessels, and other liquid or gas containers.

## ERRATUM

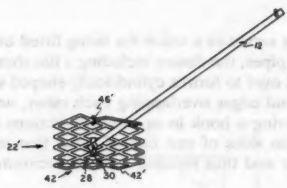
For Class 292—346 see:
Patent No. 3,673,605

3,672,716

## LIFTING DEVICE

James A. Burckhalter, 908 Meadow St., Columbia, S.C.

Filed March 5, 1971, Ser. No. 121,460
Int. Cl. A01d 7/06
U.S. Cl. 294—50.6 10 Claims

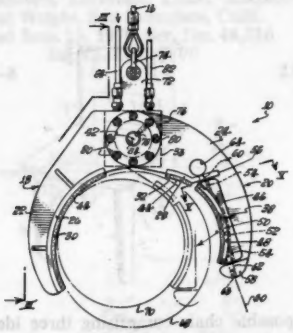


A device is disclosed that is capable of engaging and holding various materials during lifting and moving thereof. The tool of the present invention comprises two arms or handles that are secured to each other at one end while remaining separate at said end and have heads pivotally secured to the opposite ends thereof for engagement and holding of materials to be picked up. The heads are pivotally secured to the arms in the same plane of the arms and are provided with slots partially along their length through which the arms extend so as to render the tool self-adjusting to the terrain and also height of the individual using same. The heads extend downwardly below the arms, turn inwardly towards each other and are provided with a smooth contour on the inwardly turned ends thereof. Preferably, the heads are constructed from metal having a plurality of openings therein such as expanded metal. The pivot connection between the arms at the end opposite the heads is substantially universal, in that, the individual arms can be moved about various arcs and easily brought back together to a gripping and lifting relationship with the opposing head. The connection is formed by a pivot member which extends horizontally through a first arm, turns outwardly and returns vertically through the second arm.

## 3,672,717
## CLAW ARMS WITH SWIVEL PLATE

Jack I. Sayre, Glendora, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 25, 1971, Ser. No. 109,318
Int. Cl. B66c *1/44*
U.S. Cl. 294—104 10 Claims

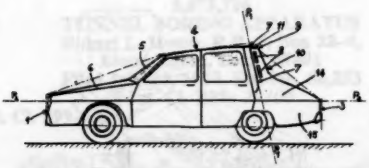


A claw assembly for retrieving conical objects including a pair of pivoted arms which have inner facing curved surfaces; a swivel plate pivotally mounted to at least one of the arms, said swivel plate having an inner facing curved surface; and the pivot axis of the swivel plate being in a plane which is substantially perpendicular to the pivot axis of the arms. With such an arrangement one arm is capable of engaging a circumference of the conical object and the swivel plate of the other arm is capable of pivoting to engage a tapered portion of the object.

## 3,672,718
## AUTOMOBILE BODIES

Robert Broyer, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt (Hauts de Seine), France

Filed June 1, 1970, Ser. No. 42,136
Claims priority, application France, June 16, 1969, 6919907
Int. Cl. B62d *35/00*
U.S. Cl. 296—1 S 8 Claims

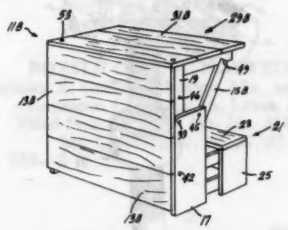


A body of automotive vehicle, and more particularly of mass-produced passenger vehicle, characterized in that its general configuration comprises two opposed irregular frustums of pyramid with non-parallel bases, assembled at their major bases, one frustum having an elongated shape converging to the front to constitute the passenger compartment and the front portion of the vehicle, its minor base constituting the front face and its major base corresponding to the greater cross-section of the vehicle body, which is located substantially at the rear of said passenger compartment, the other frustum being shorter and converging sharply to the rear, with the minor base constituting the rear end face of the vehicle and major base coplanar with that of the first or front frustum of pyramid, the perimeter of this major base following a contour slightly parallel to that the major base of said one frustum but being slightly recessed in relation thereto in order to provide a continuous, sharp-edged shoulder along the perimeter of said major base, on the faces corresponding to the roof and to the upper portion of the side panels of the body.

## 3,672,719
## COMBINATION TABLE AND SERVING BAR

Blane L. Haukedahl, 4139 Mar Moor Drive, Lansing, Mich. 48917

Filed Mar. 1, 1971, Ser. No. 119,527
Int. Cl. A47b *83/02*
U.S. Cl. 297—118 8 Claims

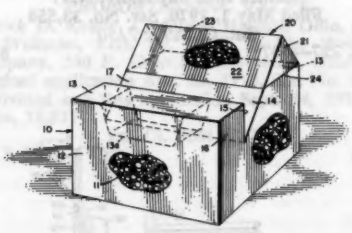


A picnic style of table is disclosed, having a top which may be articulated to an alternate vertical position, and a bench which is disconnected from the main picnic table structure and which is adapted for alternate disposition over the vertically articulated table top so that in their alternative positions the table top and bench form the counter and vertical front, respectively of a free standing serving counter-bar.

## 3,672,720
## MULTI-PURPOSE ARTICLES OF FURNITURE

Michael C. Wilson, 332 Pennsylvania Ave., Glen Ellyn, Ill. 60137

Filed Nov. 3, 1970, Ser. No. 86,455
Int. Cl. A47c *13/00*
U.S. Cl. 297—118 2 Claims



Multi-purpose articles of furniture convertible from back-supporting seating members to beds, stools, etc., and vice versa, by selective positioning of a bolster pad removably nested in a channel or trough in the upper, body-supporting surface of the article.

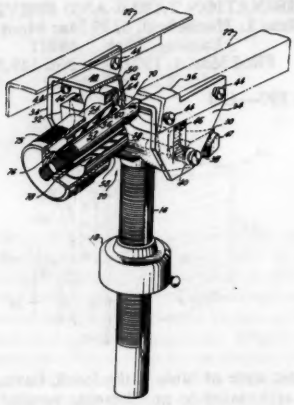
## 3,672,721
## RUBBER SPRING ASSEMBLY FOR CHAIR CONTROL

Philip J. Williams, Bridgeport, Conn., assignor to Stewart-Warner Corporation, Chicago, Ill.

Continuation-in-part of application Ser. No. 862,145, Aug. 22, 1969, which is a continuation-in-part of application Ser. No. 776,673, Nov. 18, 1968. This application May 15, 1970, Ser. No. 37,754
Int. Cl. A47c *3/00*
U.S. Cl. 297—302 1 Claim

The following specification describes a chair control utilizing an annular rubber spring bonded at its external

surface to a shell held by the post horn and bonded at its internal surface to a tube, which is longitudinally displaced in response to rotational movement of the occupant support member. A chair control is also described in which forces created in response to pivoting movement



of the chair occupant are applied in a direction corresponding to the post axis and are resisted by a spring arranged along that axis. A chair control is also disclosed for enabling movement of the chair back independently of the seat by use of an annular rubber spring placed under shear stress.

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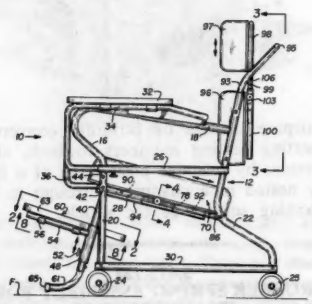
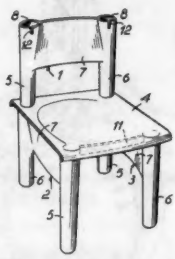
**3,672,722**
**INVALID CHAIR HAVING ADJUSTABLE HEADREST, SEAT, AND FOOTREST**
**Charles E. Murcott, Huntington, N.Y., assignor to Lumex Inc., Bay Shore, N.Y.**
**Filed May 1, 1970, Ser. No. 33,550**
**Int. Cl. A97c 7/50**
**U.S. Cl. 297—437** **6 Claims**



An invalid chair has a pair of fixed lateral frame members which support a pair of upright tubular members and a footrest assembly angularly adjustable up and down the tubular members. The frame members also support a seat which is adjustably positionable between the frame members. A backrest is secured between the frame members and adjustably supports a headrest.

**3,672,723**
**MODULAR UNIT ELEMENT FOR FURNITURE**
**Giorgio Decursu, Via R. Sanzio 30; Johathan De Pas, Via M. Greppi 11; Donato D'Urbino, Via C. Balbo 25; and Paolo Lomazzi, Via Rossini 3, all of Milan, Italy**
**Filed Apr. 24, 1970, Ser. No. 31,501**
**Claims priority, application Italy, May 3, 1969, 16,387/69**
**Int. Cl. A47c 7/00**
**U.S. Cl. 297—440** **1 Claim**



Composable chair comprising three identical modular units. Each of such units comprises two legs and a plate member connecting the legs at their upper end portions. The legs are hollow and are open at the top and are adapted to receive the lower end portions of the legs of a superposed modular unit. The legs are tapered and allow a partial copenetration. A seat member in the form of a plate, provided with projections insertable in the open ends of the legs near one of its sides and with openings in register with the bores of the legs of another modular unit, connects together two modular units forming the leg structures. The back member is formed by inserting the lower end portions of a third modular unit into the openings of the set member, in register with the bores of the legs of an underlying modular unit.

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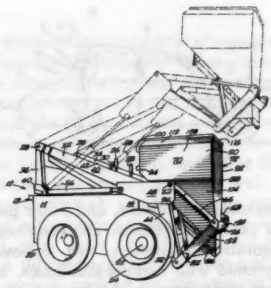
**3,672,724**
**CONTAINER IMPLEMENT FOR END LOADER VEHICLE**
**Francis E. Neuzil, Sr., 18301 NW. 5th Court, Miami, Fla. 33169**
**Filed Mar. 1, 1971, Ser. No. 119,531**
**Int. Cl. B60p 1/02, 1/56**
**U.S. Cl. 298—27** **7 Claims**



A container implement for attachment to a front end loader which includes a mounting yoke with a pair of rigid arms to pivotally connect to a front end loader and a bucket rigidly connected to the mounting yoke for hauling materials and discharge of the same through a shoot opening at the lower end. The discharge opening is adapted to be opened and closed by a hydraulically operated slide panel type door. The rear wall of the

bucket converges toward the front wall at about the discharge opening so that the weight of materials carried in the bucket has a center of gravity closely adjacent the vehicle to resist the moment tending to lift the opposite end of the vehicle to which the implement is attached.

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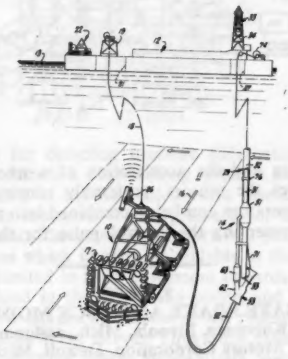
**3,672,725**
**DEEP SEA MINING METHOD AND APPARATUS**
**Edward P. Johnson, Lafayette, Calif., assignor to Earl and Wright, San Francisco, Calif.**
**Filed June 15, 1970, Ser. No. 46,316**
**Int. Cl. E02f *7/00***
**U.S. Cl. 299—8** **21 Claims**



Apparatus and method for mining material from an ocean floor. A mining vehicle traverses a predetermined path on the ocean floor while a mother vessel on the ocean surface positions itself over the mining vehicle. The material is collected by the vehicle along the path of travel, crushed, and classified to form a mixture having a predetermined solid/fluid ratio range. The mixture is pumped to the vessel through a fluid transport system including a flexible conduit extending from the vehicle and discharging into a releasable connection with the lower end of a riser conduit suspended from the vessel. The releasable connection is adapted to provide re-entry capabilities to re-establish fluid communication in the transport system and permit the vehicle to be easily raised and lowered from the mother vessel.

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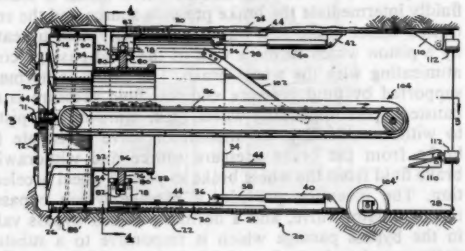
**3,672,726**
**TUNNEL BORING APPARATUS**
**Robert L. House, R.R. 5, Box 22–4, Bloomington, Ind. 47401**
**Filed July 20, 1970, Ser. No. 56,253**
**Int. Cl. E29c *29/00***
**U.S. Cl. 299—31** **10 Claims**



A tunnel boring apparatus is disclosed in which an outer tubular shield supports an inner shield for reciprocation adjacent its forward end with a rotary cutting head being mounted on the forward end of the inner shield and with the inner shield and cutting head being movable by a plurality of positioning cylinders rearwardly to be completely enclosed within the outer shield but also being movable to an extended position in which the cutting head is entirely exterior of the outer shield; another aspect of the invention resides in the provision of extendable wing teeth on the ends of the cutting bars on the cutting head movable to an extended position in which they traverse a path having a diameter larger than the diameter of the outer shield; another aspect of the invention resides in the rotational drive to the cutting head being provided by an output drive motor engaging the periphery of a ring pinion on the cutter head at a position adjacent the wall of the inner shield.

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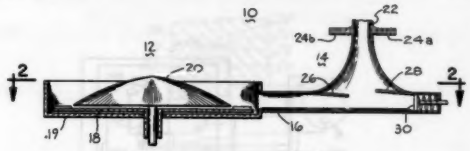
**3,672,727**
**BOTTLE ORIENTING SYSTEM**
**Leonard E. Griffin, O'Fallon, Mo., assignor to Monsanto Company, St. Louis, Mo.**
**Filed Dec. 29, 1969, Ser. No. 888,387**
**Int. Cl. B65g *47/24, 51/02***
**U.S. Cl. 302—2 R** **3 Claims**




A method and apparatus for orienting or aligning bottles utilizing substantially no moving parts in that substantially opposing double prong members permit the bottle neck to pass through one of the double prong members while the opposite end of the bottle is held in place by the other double prong member.

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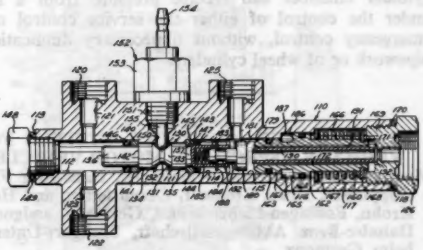
**3,672,728**
**COMBINATION BRAKE WARNING SWITCH AND PROPORTIONING VALVE**
**Frederick D. Keady, Cleveland Heights, Ohio, and Ellis M. Wellman, Erie, Pa. (both % The Weatherhead Company, 300 E. 131st St., Cleveland, Ohio 44108)**
**Original application Apr. 22, 1970, Ser. No. 30,887. Divided and this application Sept. 14, 1970, Ser. No. 71,917**
**Int. Cl. B60t *17/22***
**U.S. Cl. 303—6 C** **4 Claims**



A combination brake warning switch and proportional valve includes a housing having an axial bore within which is located a switch piston and a proportioning piston at opposite ends of the bore. Fluid from two circuits of a dual brake system master cylinder is introduced to the bore on opposite sides of the switch piston which performs a switch actuating function in case of a pressure

unbalance. The proportioning valve piston cooperates with a valve seat member slidably carried on the end of the switch piston to reduce the outlet pressure in one circuit when the inlet pressure exceeds a predetermined level. In the event of failure of the other circuit, movement of the switch piston moves the valve seat member away from the proportioning piston which is then inoperable. When the proportioning valve is operative, the movable valve seat member cooperates with the proportioning piston so that the proportional relation between inlet and outlet pressures in the one circuit is maintained when the pressures are decreasing. A stop is provided to prevent the valve seat member from engaging the proportioning piston in the event of a pressure loss in the one circuit.

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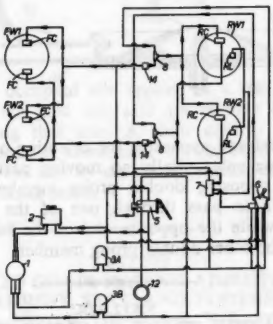
**3,672,729**
**VEHICLE BRAKING SYSTEMS**
**Roy Blakey, Tyseley, England, assignor to Girling Limited, Birmingham, England**
**Filed Oct. 15, 1970, Ser. No. 81,093**
**Claims priority, application Great Britain, Oct. 17, 1969, 51,103/69; Aug. 10, 1970, 38,442/70**
**Int. Cl. B60t *13/58***
**U.S. Cl. 303—9** **9 Claims**



A vehicle hydraulic brake system has separate pressure sources and separate service and emergency brake control means for supplying pressure from those sources to the individual wheel cylinder, as well as lock units and a manual control for operating the same. Pressure lines leading from the service and emergency brake control are branched into each other by means for changeover valves acting as double check valves so that any individual wheel cylinder chamber can receive pressure from a source under the control of either the service control or the emergency control, without unnecessary duplication of pipework or of wheel cylinders.

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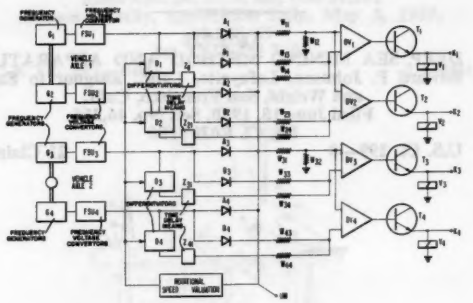
**3,672,730**
**BRAKE FORCE CONTROLS SYSTEM FOR VEHICLES, ESPECIALLY MOTOR VEHICLES**
**Manfred H. Burckhardt, Waiblingen, Hans-Jorg Florus, Goppingen, Horst Grossner, Geradstetten, and Helmut Krohn, Esslingen-Liebersbronn, Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Untertürkheim, Germany**
**Filed June 22, 1970, Ser. No. 48,001**
**Claims priority, application Germany, June 25, 1969, P 19 32 128.9**
**Int. Cl. B60t *8/08, 8/12***
**U.S. Cl. 303—21 BE** **32 Claims**

A brake for control system for vehicles, particularly for motor vehicles in which a sensor is coordinated to each wheel for detecting its rotational condition; the sensor produces pulses when exceeding or falling below a predetermined threshold value which influences the brakes in accordance with both the wheel slippage and also the wheel acceleration, measuring magnitudes representing



the slippage and the acceleration of a wheel being obtained from the sensors, preferably constructed as frequency generators and being combined into a signal magnitude representing the control pulse for the brakes.

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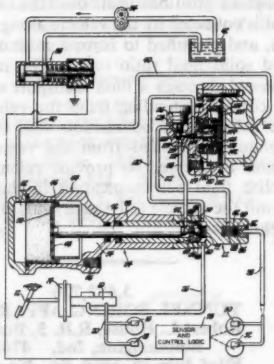
**3,672,731**
**FAIL SAFE BRAKE ANTILOCK MODULATOR**
**Erkki A. Koivunen, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.**
**Filed Dec. 18, 1970, Ser. No. 99,579**
**Int. Cl. B60t *8/06***
**U.S. Cl. 303—21 F** **3 Claims**

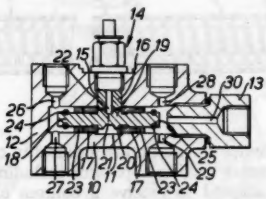


A brake pressure modulator for a vehicle brake antilock system includes a modulator valve which is located fluidly intermediate the brake pressure source and the controlled wheel brake and which is normally held unseated by a piston which forms a wall of the fluid passage communicating with the wheel brake. The piston is normally supported by fluid pressure and this fluid pressure is exhausted upon impending wheel lock, allowing the piston to withdraw, seating the modulator valve to isolate the brake from the brake pressure source and withdrawing brake fluid from the wheel brake to permit wheel acceleration. The invention provides a passage which bypasses the modulator valve, and a normally closed bypass valve in the bypass passage which is responsive to a substantially complete loss of modulator piston supporting pressure to open brake fluid communiction between the brake pressure source and the wheel brakes through the bypass passage.

## 3,672,732
## DUAL HYDRAULIC BRAKING SYSTEMS FOR VEHICLES

Martin Green, Solihull, England, assignor to Girling Limited, Birmingham, England

Filed May 18, 1970, Ser. No. 38,195
Claims priority, application Great Britain, July 1, 1969, 33,171/69
Int. Cl. B60t 17/22
U.S. Cl. 303—84 A 10 Claims

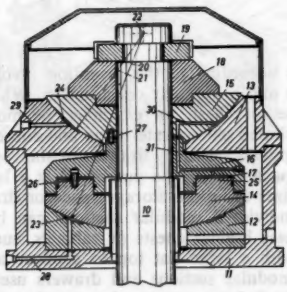


In means for detecting pressure differentials between hydraulic circuits in a dual braking system a piston assembly is mounted in the bore of a valve housing and has opposed ends subjected to the pressures of the two hydraulic circuits. The assembly comprises a piston slidable in two sleeves which in turn are slidable in the bore. The sleeves are limited in their movement towards each other by a stop fixed in the bore. The piston and sleeves are keyed together against movement of the piston away from the stop relative to the sleeves. Thus when pressure on one end of the assembly differs substantially from the other end, the piston and one sleeve move towards the low pressure end and in so doing actuate indicator means. When the pressures become substantially equal again the pressure at one end acts on the end of the piston and said one sleeve to move the piston against equal pressure acting on the smaller area of the other end of the piston, the other sleeve remaining unmoved. This renders the indicator means again inoperative.

## 3,672,733
## AXIAL BEARING

Torsten Henry Arsenius, Anders Christer Gustafsson, and Karl Goran Albin Halstedt, Goteborg, Sweden, assignors to SKF Industrial Trading and Development Company N.V., Amsterdam, Netherlands

Filed Mar. 1, 1971, Ser. No. 119,510
Claims priority, application Sweden, Mar. 2, 1970, 2,661/70
Int. Cl. F16c 17/04, 17/16
U.S. Cl. 308—9 8 Claims

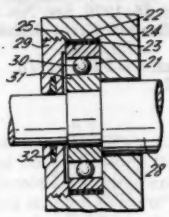


In an axial hydrostatic bearing the load is carried by at least two members, each cooperating with a support in a fixed housing. At least one pocket connected to a source of pressure fluid is arranged at each pair of cooperating working surfaces between a carrying member and its support, and an adjusting mechanism including a piston working in a cylinder is fitted between the carrying members and operatively connected to one of them. The cylinder is connected to at least one pocket at the pair of working surfaces at the opposite member to receive pressure fluid at a pressure proportional to the pressure fluid therein. Hereby the axial position of the two carrying members will be automatically adjusted in relation to each other in accordance with occasional changes in the load, and each member will carry its allotted portion of the load.

## 3,672,734
## BEARING ADAPTOR

Sigeru Bando, Tokushima, Japan, assignor to Bando Kiko Co., Ltd., Tokushima, Japan

Filed July 23, 1970, Ser. No. 57,531
Claims priority, application Japan, Oct. 10, 1969, 44/80,819; Feb. 3, 1970, 45/11,195; Feb. 10, 1970, 45/13,374; Feb. 18, 1970, 45/16,388; Feb. 20, 1970, 45/17,193; May 20, 1970, 45/49,895; May 23, 1970, 45/50,366
Int. Cl. F16c 35/06
U.S. Cl. 308—26 4 Claims

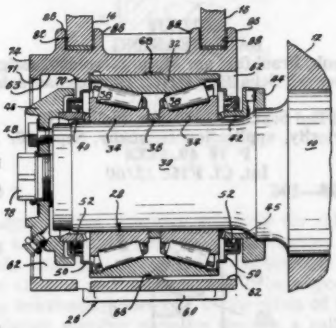


The bearing adaptor comprises an elastic body adapted to be secured on the outer peripheral surface of the bearing and a rigid elastic sleeve adhered on the outer peripheral surface of the elastic body, said sleeve being terminated at opposite ends thereof so as to define any clearance between said both ends.

## 3,672,735
## BEARING HOUSING

Thomas C. Keller and Robert F. Heggy, Canton, Ohio, assignors to The Timken Company, Canton, Ohio

Filed Aug. 20, 1970, Ser. No. 65,624
Int. Cl. F16c 13/04
U.S. Cl. 308—180 10 Claims



A bearing housing has a bore sized to receive a double row tapered roller bearing. At the upper portion of the bore arcuate pads are formed on the housing and the curvature of these pads matches the curvature of the

bearing cup so that good load distribution is achieved. A narrow retaining rib extends circumferentially along the remaining portion of the cavity and merges at its upper ends into the pads. The rib has an inwardly presented surface which is concentric to the seating surfaces of the pads and is slightly greater in diameter than those pad surfaces. The rib surface is positioned midway between the ends of the bearing and extends completely around the cavity, forming a relief between the pads. A thrust shoulder extends into the cavity beyond the pads and forms an abutment against which the end face of the cup bears. The close proximity of the rib surface to the bearing cup prevents the cup from disengaging and passing beyond the thrust shoulder and further keeps the bearing substantially centered in the housing. Since all the curved surfaces are concentric, they can be machined in one machine set up. The narrowness of the rib does not allow fretting corrosion to hamper disassembly of the bearing from the housing.

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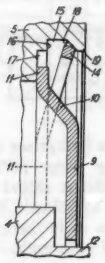
**3,672,736**
**ANNULAR SHIELD FOR BEARINGS**
**Ivanhoe J. Rathbone, Ascot, England, assignor to Remo Precision Tools Limited, Wokingham, England**
**Filed Jan. 26, 1970, Ser. No. 5,835**
**Claims priority, application Great Britain, Feb. 12, 1969, 7,674/69**
**Int. Cl. F16c *33/78***
**U.S. Cl. 308—187.2** **5 Claims**



The invention is concerned with a bearing having at least one end an annular shield between the inner and outer races. The shield is held in position within the outer race by means of resilient radially outer portions which are outwardly displaced from the otherwise circular outer edge of the shield, these portions being received as a snap fit in a groove formed in the outer member.

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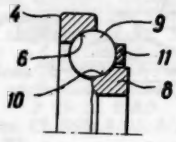
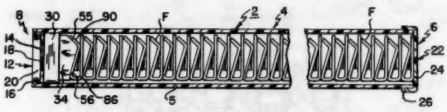
**3,672,737**
**BALL BEARING**
**Werner Jacob, Frankfurt am Main, Germany, assignor to Industrierwerk Schaeffler OHG, Herzogenaurach, Germany**
**Filed Sept. 29, 1970, Ser. No. 76,570**
**Claims priority, application Germany, Sept. 30, 1969, P 19 49 243.4**
**Int. Cl. F16c *33/60***
**U.S. Cl. 308—196** **3 Claims**




A process for the manufacture of race rings for inclined ball bearings and a process for the manufacture of ball bearings using such race rings.

**3,672,738**
**CARTRIDGE DEVICE FOR FASTENERS AND THE LIKE**
**Albert T. Buttriss, Westlake, Ohio, assignor to Eaton Corporation, Cleveland, Ohio**
**Filed Feb. 9, 1970, Ser. No. 9,834**
**Int. Cl. A47f *1/00***
**U.S. Cl. 312—71** **12 Claims**




A cartridge device for mounting a plurality of fasteners for use in a fastener driving apparatus including a hollow body member adapted to receive a column of fasteners having a forward and rearward end. A plunger member disposed interiorly of the body member initially adjacent the rearward end and a closure member disposed over the rearward end of the body member. The closure member having aperture means to receive fluid under pressure therethrough for moving the plunger member interiorly of the body member to discharge fasteners from the forward end of the body member.

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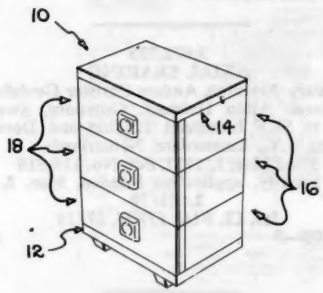
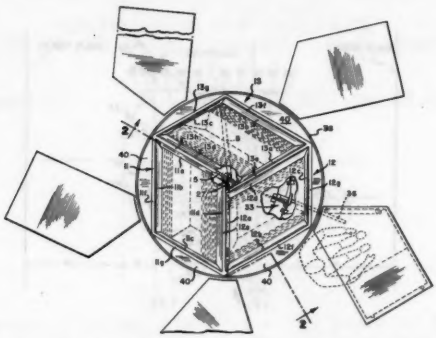
**3,672,739**
**MODULAR, KNOCK-DOWN FURNITURE**
**Karl H. Taut, 602 Lincoln St., Archbold, Ohio 43502**
**Filed Aug. 6, 1970, Ser. No. 61,544**
**Int. Cl. A47b *47/04***
**U.S. Cl. 312—107** **3 Claims**



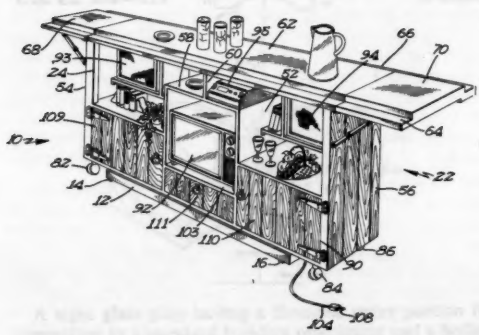

Furniture according to the invention involves both a knock-down and a modular construction. When designed for a cabinet or chest, for example, the modular units can be purchased as separate items and subsequently assembled to provide as many drawers or shelves as desired. Additional packages can be purchased at a later time as the need arises for more storage space or drawer space. Also, the individual modular sections can be used for other purposes besides chests or cabinets, such as being combined with a large flat top to produce a desk. The individual modular sections and drawers used therewith are of a knock-down construction, so that they can be shipped in a state occupying only approximately one-fifth the volume of conventional furniture. Storage space also is correspondingly reduced for additional savings. Further, the knock-down units can be assembled with a minimum of skill or tools.

3,672,740
**SUPPORT FOR ROTARY FILING SYSTEM**
Romeo T. Proulx, Copiague, N.Y., assignor to Barry Wright Corporation, Watertown, Mass.
Filed Mar. 4, 1971, Ser. No. 121,112
Int. Cl. A47b *53/00, 87/00*
U.S. Cl. 312—202 9 Claims



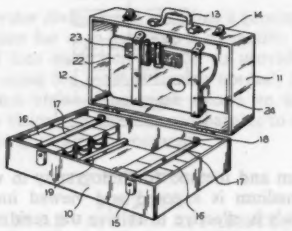
An improved support for a rotary filing system comprising two sets of vertically spaced support arms rotatably mounted on a vertical shaft. The upper set of arms support containers for holding file data in a cantilever fashion while the lower set of arms support the containers from underneath. The different parts of the support structure are constructed as separate compact elements for assembly at the site of use of the filing system. The containers for holding the file data have a rhomboid shape and are arranged around the support shaft in side-by-side relation.

3,672,741
**COMBINED DRINK BAR AND ROOM DIVIDER CONSOLE**
Terry D. Clark, 1537 E. 32nd St., Minneapolis, Minn. 55403
Filed Nov. 3, 1970, Ser. No. 86,480
Int. Cl. A47b *77/08, 95/18, 49/00*
U.S. Cl. 312—223 1 Claim



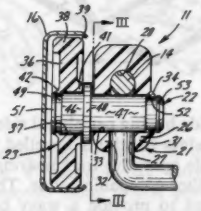
A multi-purpose furniture structure with an upright frame rotatably mounted to a stationary pedestal. The frame has a plurality of castors which partially support the frame and aid in its rotation relative to the stationary pedestal. A countertop is affixed to the top of the frame, and a longitudinal side of the frame has a plurality of open shelves to create a decorative room divider console. The remaining longitudinal side of the frame is closed to form a drink bar. The pedestal and frame are provided with cooperating pin and sockets to retain the frame in predetermined positions.

3,672,742
**PAINT CASES, PALETTE, AND CONVEYOR**
Dora A. Barg, 4573 N. 30th St., Milwaukee, Wis. 53209
Filed Oct. 21, 1970, Ser. No. 82,592
Int. Cl. A47b *27/00, 63/04, 95/02*
U.S. Cl. 312—232 3 Claims



An artist's paint box includes a palette having a strip of "Velcro" brand hook and loop tape fastener material on the bottom thereof. A drawer and housing combination has a matching strip of "Velcro" hook and loop tape fastener material on the top. When the housing is attached to the bottom of the palette, the drawer may be pulled out to form a palette cup.

3,672,743
**ROLLER AND RETAINER FOR A WIRE BASKET**
Walter Pompey, Kalamazoo, Mich., assignor to W-L Molding Company, Portage, Mich.
Filed Aug. 17, 1970, Ser. No. 64,163
Int. Cl. A47b *97/00*
U.S. Cl. 312—352 8 Claims



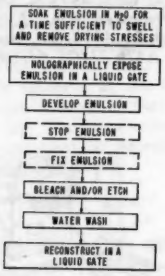
A support roller assembly primarily for rollingly supporting a wire basket, such as in a dishwasher. The roller assembly includes an inverted, substantialy U-shaped plastics retainer member adapted to be disposed in embracing relationship with one of the wires of the basket. The retainer member supports thereon a roller support shaft or stud, the stud being axially connected to the retainer member by means of a resilient snap fit. The stud in turn rotatably supports a plastics roller thereon, which roller is resiliently snapped onto the stud so as to be axially retained relative to the basket.

**3,672,744**

## HOLOGRAPHIC SYSTEM AND PROCESS UTILIZING A WET CELL PHASE HOLOGRAM

**Douglas H. Strope and Alan D. Wilson, Apalachin, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Oct. 6, 1970, Ser. No. 78,535**
**Int. Cl. G02b 27/00**
**U.S. Cl. 350—3.5** **5 Claims**


SOAK EMULSION IN $H_2O$ FOR A TIME SUFFICIENT TO SWELL AND REMOVE DRYING STRESSES
HOLOGRAPHICALLY EXPOSE EMULSION IN A LIQUID GATE
DEVELOP EMULSION
STOP EMULSION
FIX EMULSION
BLEACH AND/OR ETCH
WATER WASH
RECONSTRUCT IN A LIQUID GATE

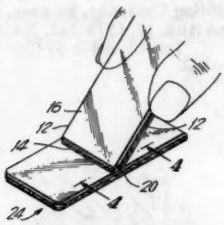
A system and method for holography in which the recording medium is exposed and viewed immersed in a liquid which is effective to relieve the residual stresses in the medium.

**3,672,745**

## BEVELLED EDGE MICROSCOPE SLIDE

**Irving A. Speelman, Roslyn Heights, N.Y., assignor to Propper Manufacturing Co., Inc., Long Island City, N.Y.**

**Continuation of application Ser. No. 746,060, July 19, 1968, which is a continuation-in-part of application Ser. No. 477,801, Aug. 6, 1965. This application June 29, 1970, Ser. No. 50,975**
**Int. Cl. G02b 21/34**
**U.S. Cl. 350—92** **2 Claims**




A microscope slide having peripheral side and end edges or peripheral end edges which are bevelled with a bevelled end edge of the slide operative for smearing of a specimen on the face of another companion slide. The bevelled side edges are structured to provide a wavy configuration to facilitate grasping of the slide for the smearing operation.

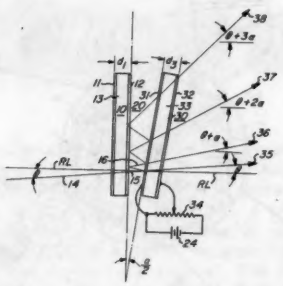
**3,672,746**

## DIGITAL LIGHT DEFLECTOR USING OPTICAL RESONATORS

**Arthur Miller, Princeton Junction, N.J., assignor to RCA Corporation**

**Filed Jan. 14, 1970, Ser. No. 2,856**
**Int. Cl. G02b 27/00**
**U.S. Cl. 350—163** **8 Claims**

A light deflector is disclosed which includes an input Fabry-Perot type resonator, and an output Fabry-Perot type resonator. The two resonators are separated by a transparent wedge having an angle $\alpha/2$. A source of a laser beam of monochromatic coherent light is directed to the input resonator at an angle of incidence $\theta$ (relative to a normal reference line) at which the resonator exhibits a transmission peak, so that a beam of light is transmitted into and through the transparent wedge to the output resonator. Means are provided to vary a physical parameter in the light path through the second resonator in amounts to cause a beam of light to emerge from the output resonator at any one of many angles, relative to said reference line, approximately equal to $\theta$ plus an integral multiple including zero of $\alpha$. The parameter varied may be the phase delay in the output resonator, or a physical spacing of resonator surfaces.

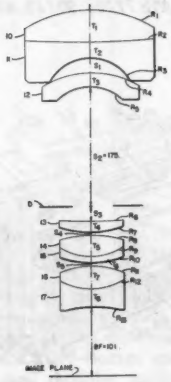



**3,672,747**

## OBJECTIVE LENS FOR SHORT FOCAL LENGTH CAMERAS AND PROJECTORS

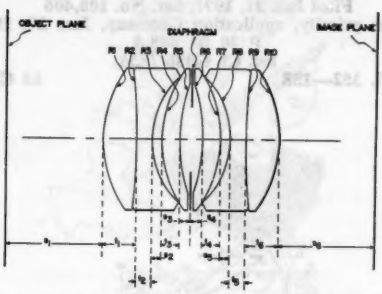
**John R. Miles, Elk Grove Village, Ill., assignor to Retention Communications Systems, New York, N.Y.**

**Filed Nov. 13, 1970, Ser. No. 89,287**
**Int. Cl. G02b 9/60**
**U.S. Cl. 350—216** **1 Claim**



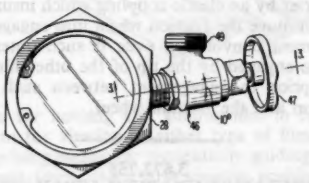

An objective lens designed for cameras and projectors for short focal length applications of the order of 1 cm. but having lens components which are relatively large and comparatively easy to manufacture. The system has a speed of $f/2$ and a back focal length equal to 101.1% of the focal length of the lens. There is a central space equal to 1.75F for positioning a shutter.

3,672,748
## SPLIT DAGOR-TYPE OF SYMMETRICAL COPYING LENS SYSTEM
Yoshikazu Doi and Yasuo Honda, Oomiya, Japan, assignors to Xerox Corporation, Stamford, Conn.
Filed May 14, 1971, Ser. No. 143,372
Int. Cl. G02b 9/58
U.S. Cl. 350—220 2 Claims



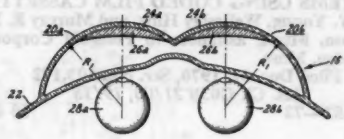

A split Dagor-type of symmetrical copying lens system having front and back compound lens components with a centrally-located diaphragm therebetween adapted to an optical system of a copier which can be used at 1:1 magnification. The front lens component has three lens elements including, in the following order, a first lens element of positive power, a second lens element of negative power cemented to the first lens element and a third lens element of positive power disposed between the second lens element and diaphragm, and the back lens component having three similar lens elements positioned so that the lens system is symmetrical.

3,672,749
## SIGHT GLASS FOR THE INSIDE INSPECTION OF PIPES AND CLEANING OF SAME
Kenneth F. Roser, R.F.D. 4, Rome, N.Y. 13440
Continuation-in-part of application Ser. No. 826,946, May 22, 1969. This application Sept. 11, 1970, Ser. No. 71,439
Int. Cl. G02b 5/00
U.S. Cl. 350—319 3 Claims



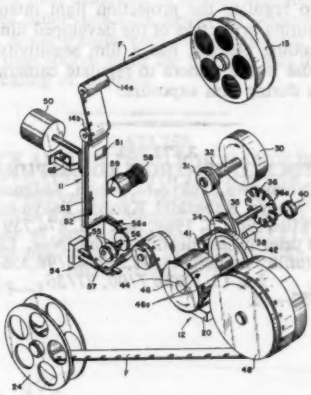
A sight glass plug having a threaded outer portion for connection to a standard building pipe fitting and a hollow interportion having a circular seat and a spaced apart recess in the surface thereof for holding an O-ring, a glass viewing window, and a snap-ring in sealing engagement with the inner surface of the plug. A valve controlled inlet allows pressurized fluid to impinge against the glass and the plug housing interior at a double inclination to ensure vortex cleaning of the same.

3,672,750
## UNDERWATER DIVING MASK
Kenneth G. Hagen, Devon, Pa., assignor to General Electric Company
Filed July 31, 1970, Ser. No. 59,917
Int. Cl. G02c 1/00
U.S. Cl. 351—43 12 Claims



An underwater diving mask including a generally spherical lens portion for each eye with a corrective lens being incorporated into each lens portion to provide in-focus underwater vision for persons having normal, far-sighted or near-sighted vision. The mask allows an underwater diver to have vision substantially comparable to that which he would have in an air environment.

3,672,751
## FILM ADVANCING APPARATUS
William Allen Martin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 2, 1970, Ser. No. 94,260
Int. Cl. G03b 21/48, 31/02
U.S. Cl. 352—30 7 Claims



Film advancing apparatus for a motion picture projector includes a continuously driven film pulldown mechanism disposed along a first portion of a predetermined film path and having a claw member adapted to intermittently engage and move a filmstrip past an aperture of a film projection station. The apparatus also includes a continuously driven film transport mechanism disposed along a second portion of the path and having a portion engageable with the filmstrip and adapted to continuously move the filmstrip so that a sound track provided on the strip moves past a transducer at a substantially uniform speed. The apparatus further includes an electrically actuable member movable between a first position wherein it is effective to prevent the intermittent mechanism from moving film and a second position wherein it permits the intermittent mechanism to move film, and circuitry for actuating the electrically actuable

member to move between its positions in response to the rate of film movement of the transport mechanism to adjust the rate of film movement of the intermittent mechanism as a function of the rate of film movement of the transport mechanism.

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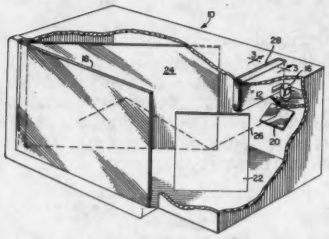
**3,672,752**
**PHOTOGRAPHIC FILM EXPOSURE AND VIEWING SYSTEMS USING CODED FILM CASSETTE**
**Richard W. Young, Wellesley Hills, and Murray E. Malin, Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.**
**Filed Dec. 31, 1970, Ser. No. 103,172**
**Int. Cl. G03b *21/00, 19/18***
**U.S. Cl. 352—72** **10 Claims**



A photographic film transparency exposure and projection system in which the film is contained in a cassette mountable in both the camera and the projector of the system. The cassette is provided with a coding element corresponding to the projection density of the particular film contained therein, which element cooperates with the projector to regulate the projection light intensity automatically during projection of the developed film. In addition, the coding element has a film sensitivity value to enable its use in the camera to regulate camera exposure parameters during film exposure.

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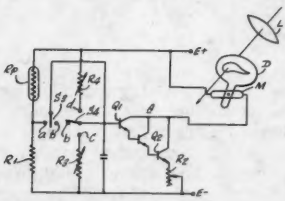
**3,672,753**
**PHOTOCELL CONTROLLED DIAPHRAGM**
**Tsukumo Nobusawa, Tokyo-to, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan**
**Filed Nov. 7, 1969, Ser. No. 874,739**
**Claims priority, application Japan, Nov. 13, 1968 (utility model), 43/82,517, 43/98,336**
**Int. Cl. G03b *7/00, 21/36***
**U.S. Cl. 352—91** **8 Claims**



A motion picture diaphragm control mechanism includes a photoconductor and resistor connected in series across a voltage source the junction being connected through a switch to the input of a Darlington amplifier. An adjustable diaphragm is connected to the armature of a meter movement whose winding is connected between a voltage terminal and the collector of the amplifier output transistor, the emitter thereof being grounded through a first variable resistor. A memory capacitor shunts the amplifier input. A second variable resistor may be connected through a switch across the capacitor and the capacitor may be connected to the voltage source through a third variable transistor and switch.

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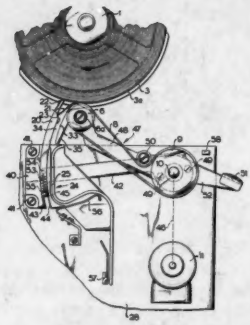
**3,672,754**
**FILM THREADING MECHANISM FOR USE IN MOTION PICTURE PROJECTORS OR THE LIKE**
**Wolfgang Riedel, Winnenden, Germany, assignor to Silma S.p.A., Turin, Italy**
**Filed Jan. 21, 1971, Ser. No. 108,406**
**Claims priority, application Germany, Jan. 27, 1970, P 20 03 448.4**
**Int. Cl. G03b *1/58***
**U.S. Cl. 352—158** **14 Claims**



A threading mechanism for the leader of motion picture film in a motion picture projector has a drive for rotating the supply reel in a direction to pay out the film at the will of the operator. The drive has a shaft which is driven by an electric motor and transmits torque to a friction wheel mounted on a carrier which is pivotable about the axis of the shaft to move the friction wheel into and out of engagement with the outermost convolution of film on the supply reel. The carrier further supports two film directing members having surfaces which define an arcuate path for directing the leader of motion picture film into the channel of a fixed film guide assembly. One of the film directing members is located between the other film directing member and the friction wheel, and the other film directing member has a tip which is movable into engagement with the outermost convolution to intercept the leader and to direct the thus intercepted leader into the path between the surfaces of the two film directing members when the friction wheel drives the supply reel. The other film directing member is connected to the carrier by an elastic coupling which insures that the carrier can move the friction wheel into engagement with the outermost convolution even if such outermost convolution is engaged by the tip of the other film directing member prior to engagement between such outermost convolution and the friction wheel.

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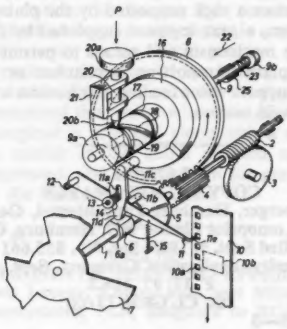
**3,672,755**
**CINEMATOGRAPHIC APPARATUS**
**Heldemar Radl, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany**
**Filed Dec. 8, 1970, Ser. No. 96,062**
**Claims priority, application Germany, Dec. 13, 1969, G 69 48 290.2**
**Int. Cl. G03b *1/22***
**U.S. Cl. 352—194** **10 Claims**

The film transporting mechanism of a motion picture projector has two rotary in-out cams the first of which moves the claw of the pull-down into and out of perforations of motion picture film at a normal frequency and

the second of which can be shifted axially to an operative position so as to override the first cam during certain stages of each revolution to thus reduce the frequency of film transport. The shifting device for the second cam consists of a helical groove machined into a cylindrical



extension of the second cam and a wiper which can be moved by hand to enter the groove. The second cam is driven by a gear train which receives torque from the shaft for the first cam. The shaft further rotates a shutter and a transporting cam which moves the pull-down in and counter to the direction of film transport.

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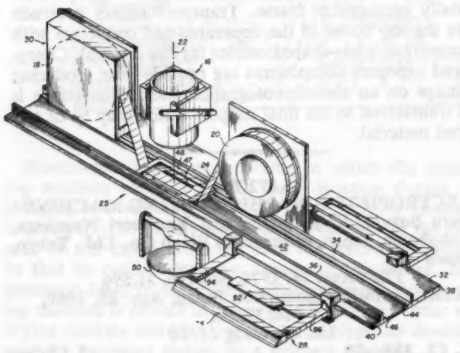
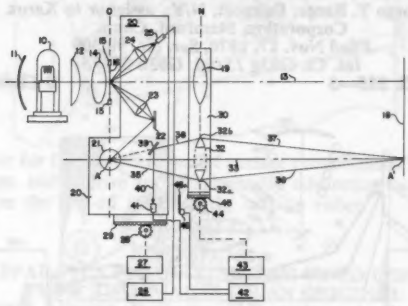
**3,672,756**
**FILM VIEWER**
**William Charles Kinsinger, New York, N.Y., assignor to Metagraphic Systems, Inc., Bronx, N.Y.**
**Filed Dec. 11, 1969, Ser. No. 884,260**
**Int. Cl. G03b *21/11***
**U.S. Cl. 353—68** **11 Claims**



Apparatus for holding and guiding film in either roll or plate form for viewing of either type of film through a lens, comprising means for sequentially guiding portions of film in roll form into a first viewing position of the lens disposed in a first plane, means for disposing film in plate form in a second plane parallel to the first plane, the second plane containing a second viewing position of the lens, means for moving the film in plate form within the second plane to position a desired portion thereof within the second viewing position, and means mounting the lens for movement relative to the viewing positions for focusing on film in either viewing position. A microfilm reader utilizing the aforesaid apparatus is provided which is capable of reading microfilm in roll form or in plate form.

**3,672,757**
**AUTOMATIC FOCUSING SYSTEM FOR PROJECTORS AND THE LIKE**
**Oleg Szymber, Elk Grove, and Norman Shim, Glenview, Ill., assignors to GAF Corporation, New York, N.Y.**
**Filed Sept. 14, 1970, Ser. No. 72,076**
**Int. Cl. G03b *3/00, 21/14***
**U.S. Cl. 353—101** **15 Claims**



A first appraisal sub-system includes a focusing lens mounted for movement with the projector objective lens to establish a focusing axis parallel with the projector optical axis. This sub-system includes a light source movably mounted on the focusing axis and detection means responsive to variations in the distances of such light source and the screen from the focusing lens and for moving the latter to maintain a predetermined relationship between such distances. A second appraisal sub-system includes other detection means for sensing buckling or popping of the transparency and for moving the aforementioned light source along the focusing axis in response to such buckling or popping.

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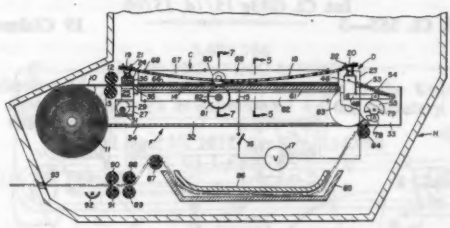
**3,672,758**
**DEVICE AND METHOD FOR HANDLING A FLEXIBLE PHOTOCONDUCTOR**
**William A. MacDonald, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**
**Continuation of application Ser. No. 665,915, Sept. 6, 1967. This application Apr. 24, 1970, Ser. No. 29,742**
**Int. Cl. G03g *15/00***
**U.S. Cl. 355—3** **17 Claims**



A flexible photoconductive sheet supported by opposite ends over a platen for supporting a receiving sheet wherein the photo conductive sheet is lowered while an electric potential is applied between it and the platen to create an electric field therebetween. First, one end of the photoconductive sheet is brought into line contact with the receiving sheet and held there-against by electrostatic force. Then, as the other end is

lowered, the photoconductive sheet progressively contacts the receiving sheet, forcing any air out from between the sheets so that they are held in intimate contact by the electrostatic force. A clamping mechanism is used to hold the receiving sheet during separation from the photoconductive sheet following exposure to an electrostatic image.

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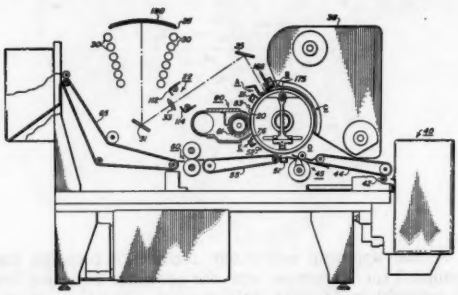
**3,672,759**
**ILLUMINATION CONTROL SYSTEM**
**George T. Bauer, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.**
**Filed Nov. 17, 1970, Ser. No. 90,309**
**Int. Cl. G03g *15/00*; G03b *27/78***
**U.S. Cl. 355—3** **8 Claims**



An illumination control system which compensates for gradual dimming or deterioration of exposure lamps in a photocopying machine. The accumulated number of reproductions made by the reproducing machine controls the current output of a variable current generator, which in turn controls the illumination projected onto the photoconductive surface in one of two ways. In the first embodiment, the current output controls an aperture slit mechanism positioned between the source of illumination and the photoconductive surface, widening the slit as the accumulated number of copies increases. In the second embodiment, the current output is coupled directly to the source of illumination, thereby controlling the amount of illumination it generates.

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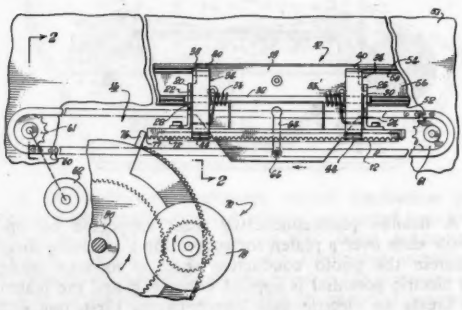
**3,672,760**
**XEROGRAPHIC PLATE TRANSPORTING MECHANISM**
**Raymond A. Lunning, Duarte, and Francis T. Mercer, Manhattan Beach, Calif., assignors to Xerox Corporation, Stamford, Conn.**
**Filed Sept. 28, 1970, Ser. No. 75,995**
**Int. Cl. G03g *15/14, 15/00***
**U.S. Cl. 355—3** **19 Claims**



An improved mechanism for transporting a flat xerographic plate through a powder image transfer station having means for equalizing the linear velocities of the plate transporting mechanism and the support sheet feeding mechanism in the transfer station, the velocity equalizing means being positioned adjacent the path of travel of the xerographic plate along the plane passing along the image-bearing surface of the xerographic plate. In the particular embodiments described, the velocity equalizing means comprises a rack supported by the plate transporting mechanism, a gear segment supported by the support sheet feeding mechanism and means to permit the motor driving the plate transporting mechanism or the motor driving the support sheet feeding mechanism to overdrive the other of said motors.

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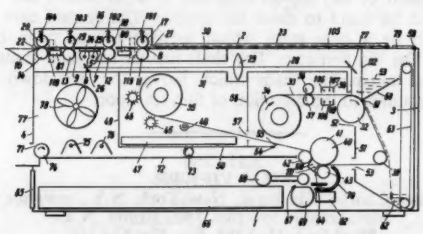
**3,672,761**
**COPYING APPARATUS**
**Walter Limberger, Hamburg-Poppenbuttel, Germany, assignor to Lumoprint Zindler KG, Hamburg, Germany**
**Filed Sept. 5, 1969, Ser. No. 855,661**
**Claims priority, application Germany, Sept. 26, 1968, P 17 97 416.2**
**Int. Cl. G03g *15/00***
**U.S. Cl. 355—3** **7 Claims**



A copying apparatus having a slot shaped exposure orifice parallel to and adjacent to a narrow edge of a substantially rectangular frame. Transport rollers protrude above the top cover of the apparatus and cooperate with a transparent, plate-shaped carrier for the original. Charging and exposure components are provided for producing an image on an electrophotographic band. The image is then transferred to the final support which may be of any desired material.

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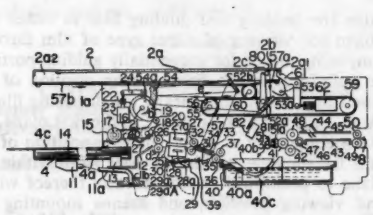
**3,672,762**
**ELECTROPHOTOGRAPHIC COPYING MACHINE**
**Shigeru Suzuki, Keiji Sugita, and Yasumori Nagahara, Yokohama, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan**
**Filed Apr. 24, 1970, Ser. No. 31,596**
**Claims priority, application Japan, Apr. 25, 1969, 44/32,511**
**Int. Cl. G03g *13/10***
**U.S. Cl. 355—10** **7 Claims**



An electrophotographic copying machine of the type in which both of an original to be reproduced and a copy paper are moved in synchronism with each other relative

to a slit exposure optical system wherein the copy paper, upon admission into a charging station, actuates a common switch which energizes the charger, the light source in the exposure optical system and an electromagnetic clutch for coupling an original carrier device to a drive mechanism until the copy paper passes through the exposure station. Upon discharge of the copy paper from the exposure station, the charger, light source and clutch are de-energized while a reverse clutch is energized so as to return the carrier to the initial position. In order to attain the precise registration of the leading edges of the copy paper and original, a device for driving the carrier after predetermined time delay when said electromagnetic clutch is energized is provided along with a member for locking the carrier in the initial position until a start button is depressed, and a mechanism for preventing any slippage of the carrier drive cable.

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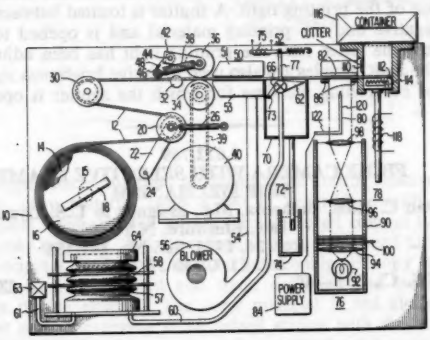
**3,672,763**

## ELECTROSTATIC PRINTING APPARATUS

**Martin Lewis Levene, Cherry Hill, and Mitsuru Yamamoto, Moorestown, N.J., assignors to RCA Corporation**

**Filed June 12, 1970, Ser. No. 45,692**
**Int. Cl. G03g *15/10***
**U.S. Cl. 355—10** **4 Claims**




Electrostatic printing apparatus in which the recording medium remains at the same location during the charging and exposure intervals. The charging electrode is preferably of needle shape and is located in the dark area of the image projected onto the recording medium so that its outline does not appear in this image. In a preferred form of the system, after exposure, the recording medium is moved in a first direction to the toner and drying stations and then moved in the opposite direction past the exposure station to a delivery station.

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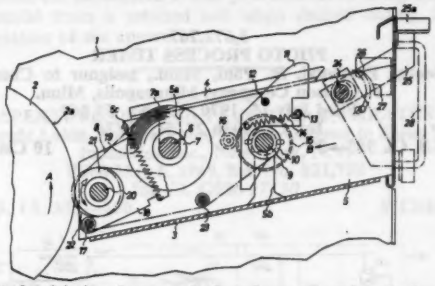
**3,672,764**

## ELECTROSTATIC COPIER WITH REMOVABLE CLEANING MODULE

**Karl Hartwig, Unterhaching, and Herbert Engel and Gunther Schnall, Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany**

**Filed Dec. 2, 1970, Ser. No. 94,422**
**Claims priority, application Germany, Dec. 4, 1969, P 19 60 800.5**
**Int. Cl. G03g *15/00***
**U.S. Cl. 355—15** **9 Claims**

A rotatable drum carrying a photoconductive layer is mounted in a housing of a copier. A cleaning module is connectable with and disconnectable from the housing in toto and comprises a pay-off roller and a take-up roller, a cleaning tape which is convoluted about the rollers, a biasing arrangement which biases increments of the cleaning tape into contact with the travelling photoconductive



layer for frictional removal of surface contaminants therefrom, and a drive for incrementally advancing the tape from the pay-off roller to the take-up roller.

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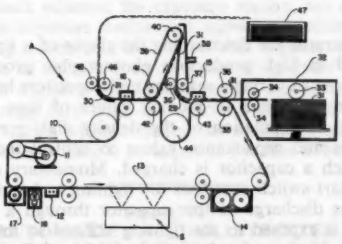
**3,672,765**

## APPARATUS FOR MAKING TWO-SIDED COPIES FROM TWO IMAGES ON AN ORIGINAL

**Conrad Altmann, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Continuation-in-part of application Ser. No. 716,092, Mar. 26, 1968. This application Aug. 3, 1970, Ser. No. 60,500**
**Int. Cl. G03b *15/00***
**U.S. Cl. 355—24** **22 Claims**



Two images from an original are placed on an endless belt **10**. The first image is xerographically transferred to one side of the copy paper **31**. The copy paper is next turned over as follows. The copy is fed past a set of rollers **36, 37** away from the path of belt **10**. An air blast urges the copy to another belt **39**. The copy sheet moves along belt **39** until it again meets the main belt **10**. After the copy sheet has been reversed, the side without the first image can receive the second image.

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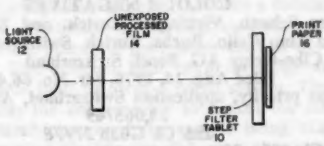
**3,672,766**

## COLOR PRINTING METHOD

**Marilyn Levy, Red Bank, N.J., assignor to the United States of America as represented by the Secretary of the Navy**

**Filed Apr. 15, 1971, Ser. No. 134,298**
**Int. Cl. G03b *27/76***
**U.S. Cl. 355—32** **2 Claims**




The correct color balance required for making color prints in color photography from a color negative is determined by printing the clear, unexposed, but processed

portion of the negative with the correct filtration so as to yield equal densities in the print to red, blue, and green light.

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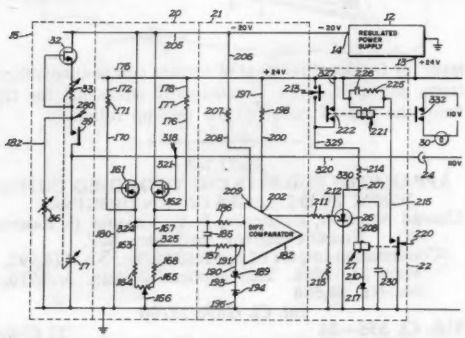
**3,672,767**
**PHOTO PROCESS TIMER**
**George Pamlenyi, St. Paul, Minn., assignor to Chesley F. Carlson Company, Minneapolis, Minn.**
**Filed July 15, 1970, Ser. No. 55,049**
**Int. Cl. G03b 27/54, 27/76**
**U.S. Cl. 355—37** **10 Claims**



Apparatus for determining the elapse of a timing cycle utilized in high production photographic process. Dials connected to variable resistors and capacitors have indicia thereon calibrated to provide values of time units and density. Manipulation of the density dials preselects resistance and capacitance values to control the potential to which a capacitor is charged. Momentary depression of a start switch energizes the lighting to be utilized and initiates discharge of the capacitor through a phototube which is exposed to the lighting utilized so that the discharge of the capacitor through the phototube is dependent upon the light intensity. The discharge of the capacitor is monitored and when the capacitor has discharged to a predetermined value, the lighting is terminated to complete the cycle. Means are provided to preset the timing cycle for all lighting normally utilized in high production photographic processes as well as means for converting the circuit for color work. In the latter case different exposure and density values for each of the various colors can be preselected before the circuit is initially energized.

The apparatus may also include a mechanical computer which allows density readings to be fed into the dials and automatically calculates and enters additional compensating values of density.

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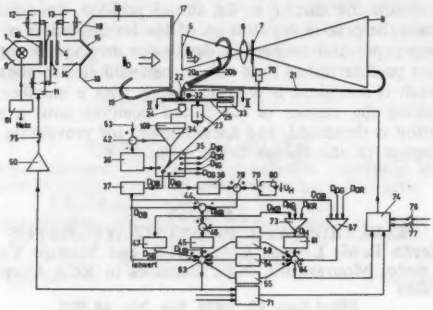
**3,672,768**
**APPARATUS FOR MAKING PRINTS FROM COLOUR NEGATIVES**
**Heiner Schaub, Wettingen, Zurich, and Kurt Thaddey and Tino Celio, Buchs, Zurich, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland**
**Filed Aug. 24, 1970, Ser. No. 66,416**
**Claims priority, application Switzerland, Aug. 28, 1969, 13,065/69**
**Int. Cl. G03b 27/78**
**U.S. Cl. 355—38** **7 Claims**

An apparatus for making prints from colour negatives has adjustable filters for controlling the colour composition of the printing light which illuminates the negative being printed. The required colour composition is dependent on the colour densities of the negative. To measure the colour densities the printing light is sampled both before and after transmission through the negative and the samples analysed in respect of their primary colour components. The corresponding components of the light samples before and after the negative are compared to



obtain difference signals representing the colour densities of the negative. These signals are used in turn to automatically adjust the filters for the correct colour composition of the printing light. A shutter is located between the negative and the printing material and is opened to expose the latter once the printing light has been adjusted. The light samples are also used to derive brightness signals for controlling the time for which the shutter is opened.

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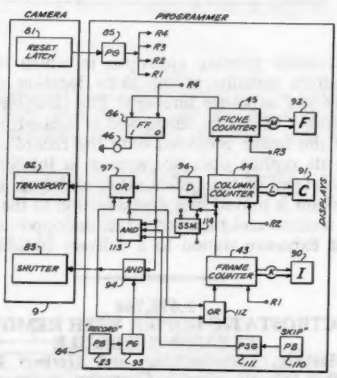
**3,672,769**
**FICHE CAMERA WITH SELECTIVE FRAME SKIP MECHANISM**
**Dan C. Ross, Bethesda, Md., assignor to U.S. Dynamics Inc., Elmsford, N.Y.**
**Filed Apr. 26, 1971, Ser. No. 137,158**
**Int. Cl. G03b 27/52**
**U.S. Cl. 355—40** **6 Claims**




A fiche camera arrangement is provided for exposing frames of a film strip which subsequently is converted to a matrix array of photographic frames on a fiche, and the camera includes a skip arrangement for selectively advancing the film by (1) one or more frames in the column of a fiche, (2) one or more columns in a fiche, or (3) one or more fiches in a reel of film. A fiche coordinate counting arrangement is provided for visually displaying

the frame, column, and fiche numbers as the strip film is exposed. Selective skipping is accomplished by operating the film transport mechanism and the fiche coordinate counting arrangement each time the skipping arrangement is operated. If a preferred fiche making process is employed, which process requires skipping one frame after each fiche column, then the skipping arrangement is inhibited from operating the fiche coordinate counting arrangement whenever a frame following a fiche column is skipped.

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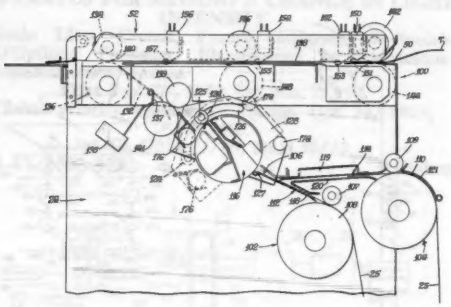
**3,672,770**
**ROLL FEEDING AND CUTTING APPARATUS FOR USE IN A PHOTOCOPY MACHINE**
**Richard G. Lee, Weston, Mass., assignor to Addressograph-Multigraph Corporation, Mount Prospect, Ill.**
**Filed June 8, 1970, Ser. No. 44,306**
**Int. Cl. G03b 27/04**
**U.S. Cl. 355—97** **27 Claims**



Apparatus is disclosed for feeding and cutting relatively wide copy material from a roll in accordance with an original document fed into a variable speed contact type copying machine. A first sensing element positioned along an original feed path initiates the feeding of copy material from a selected roll upon detecting the leading edge of the original. The copy material is fed along a copy path converging at an infeed station with the original feed path, through a cutting station and a pair of nip rollers to a second sensing means. Detection of the leading edge of the copy material by the second sensing means stops the nip rollers and therefore the movement of the leading end of the material while material continues to be dispensed from the roll. In response to the latter, loop forming apparatus comprising a clutch driven crank arm arrangement moves a loop forming rod into engagement with the copy material between the cutting station and the nip rollers. A third sensing element along the original feed path downstream of the first sensing element, detects the leading edge of the original and starts the nip rollers to move the leading end of the copy material in synchronism with the original. Upon the trailing edge of the original clearing the first sensing element, the dispensing of copy material from the roll is stopped and the crank arm arrangement, which controls a cutting device at the cutting station as well as the loop forming apparatus, operates the cutting device to sever a length of copy material corresponding to the length of the original, from the roll, and the loop forming apparatus to disengage the loop forming rod from the material. A fourth sensing element, laterally spaced from the first mentioned sensing element along the original feed path, initially selects an alternate copy material roll in the event the width of the original document is greater than a predetermined width. The feeding and cutting apparatus is also equipped to sever a short length of copy material from the roll when no original is fed along the original feed path, for the purpose of trimming the leading end of a fresh roll of copy material. A manual cut mechanism is also provided for severing copy material from a selected roll when desired during the operation of the apparatus.

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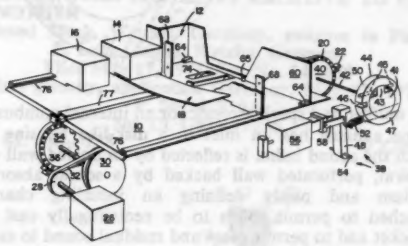
**3,672,771**
**APERTURE CARD DUPLICATOR APPARATUS**
**Harold Lakin, Portola Valley, Calif., assignor to Kleer-Vu Industries, Inc., New York, N.Y.**
**Filed May 5, 1969, Ser. No. 821,758**
**Int. Cl. G03b 27/30**
**U.S. Cl. 355—100** **9 Claims**



Aperture card duplicating apparatus in which a master aperture card is received in a receiving station adjacent to an exposure station. Copy cards are fed one at a time from a stack adjacent the exposure station, are exposed within the exposure station and moved thereafter to the developing station and then to an exit hopper. A circuit responsive to the presence of a master aperture card or film to be copied is provided to permit movement of an exposed copy card from the exposure station to the developing station without feeding an additional copy card when the film or card is no longer in position to be copied.

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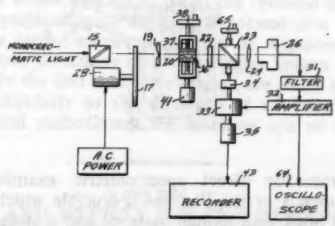
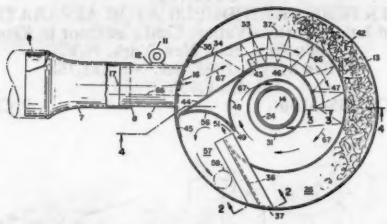
**3,672,772**
**AUTOMATIC PHOTOELASTIMETER**
**William L. Primak, Hinsdale, Ill., assignor to the United States of America as represented by the United States Atomic Energy Commission**
**Filed Aug. 31, 1970, Ser. No. 68,089**
**Int. Cl. G01b 11/18**
**U.S. Cl. 356—33** **7 Claims**



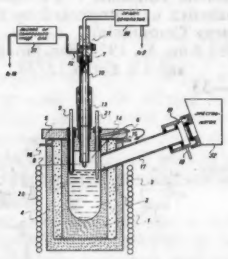

An automatic photoelastimeter includes a rotating birefringent disk positioned to develop modulation of the ellipticity of the polarized light beam used in the photoelastimeter. The detected light beam develops an A.C. signal which is used to drive a servo system. The servo system adjusts the compensator to cancel the ellipticity caused by birefringence of the sample being examined. A second rotating birefringent disk may also be used to produce additional modulation to improve the action of the servo system by sweeping the dead space of the servo system.

**3,672,773**
**EXHAUST MUFFLER AND SPARK ARRESTOR**
**Paul S. Moller, Davis, Calif., assignor to Discojet Corporation**
**Filed June 18, 1971, Ser. No. 154,385**
**Int. Cl. F01n** *1/10, 1/12, 3/06*
**U.S. Cl. 181—58** **4 Claims**



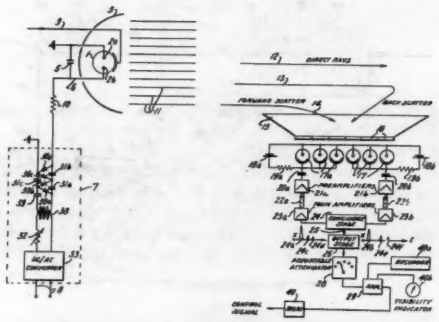
A muffler and spark arrestor for an internal combustion engine exhaust has an inlet to a disk-like housing into which the sound influx is reflected by an angled wall onto a spiral, perforated wall backed by a sound absorbing medium and partly defining an incurling chamber branched to permit solids to be centrifugally cast into a pocket and to permit gases and residual sound to escape first in an axial direction and then through radial discharge passages.

**3,672,774**
**APPARATUS FOR SPECTRAL ANALYSIS OF MOLTEN SUBSTANCES**
**Milan Bojic, Metz, and Daniel Jorre, Bougival, France, assignors to Institut de Recherches de la Siderurgie Francaise, Saint-Germain-en-Laye, France**
**Filed Dec. 7, 1970, Ser. No. 95,568**
**Claims priority, application France, Dec. 12, 1969, 6943156**
**Int. Cl. G01j** *3/02, 3/30*
**U.S. Cl. 356—86** **10 Claims**



Apparatus for direct spectrometric examination of molten metals or the like has a crucible which is to be partially filled with molten material and a jacket defining with the crucible a compartment which surrounds the crucible. The jacket has a closure for the upper ends of the compartment and of a chamber in the crucible above the exposed surface of molten material. A compressed neutral gas is circulated through the chamber and thereupon through the compartment, and the closure is traversed by two electrodes one of which dips into molten material. The electrodes are connected to the poles of a generator which produces sparks between the exposed surface of molten material and the tip of the other electrode. The thus produced light is directed for the purposes of analysis into a spectrometer by way of a duct which extends from an opening in the crucible and admits some compressed gas into the chamber above the exposed surface of molten material. The remaining gas is admitted through the holder for the other electrode which is adjustable toward and away from the exposed surface of molten material.

**3,672,775**
**METHOD AND ARRANGEMENT FOR MEASURING THE DENSITY OF NATURAL FOG IN THE FREE ATMOSPHERE USING LIGHT SOURCE WHICH IS ALSO A FLASHING WARNING BEACON**
**Frank Fruengel, Herwigredder 105a, Hamburg-Rissen, Germany**
**Continuation of application Ser. No. 194,235, May 14, 1962. This application Oct. 4, 1965, Ser. No. 498,195**
**Claims priority, application Germany, May 16, 1961, F 33,930**
**Int. Cl. G01n** *21/00, 21/26;* **H01i** *39/12*
**U.S. Cl. 356—103** **1 Claim**

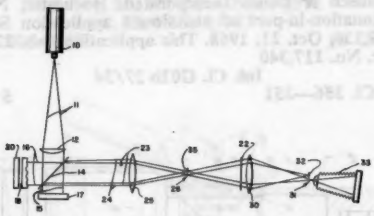


An apparatus for determining the density of natural fog in the atmosphere is disclosed. It includes a spark lamp, which also has utility as a flashing warning beacon, for projecting a light beam of consecutive light pulses of constant amplitude through the fog-laden atmosphere. The light pulses are scattered by the fog to produce consecutive light pulses proportional to the density of the fog. A light pulse receiver having its axis intersecting the axis of the transmitted beam receives the scattered light. A blind is provided to prevent direct light from the transmitter from reaching the receiver. A layer of filters may be placed in front of the photocells of the receiver as an additional means of eliminating light other than that which is scattered. The photocells are grouped into two groups each of which is A-C coupled to its own preamplifier by means of a coupling capacitor thereby excluding that part of the photocell output which is due to ambient light. The output of each preamplifier is connected to a separate input of a coincidence stage so that photocell signals which do not occur simultaneously in both groups of photocells are inhibited. A measuring means is provided for measuring the output of the coincidence stage to yield an indication of the density of fog in the region being monitored.

**3,672,776**
**HOLOGRAPHIC REAL-TIME INTERFEROMETRY WITH A RECONSTRUCTED REFERENCE BEAM**
**Robert E. Brooks, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.**
**Filed Oct. 9, 1970, Ser. No. 79,395**
**Int. Cl. G01b** *9/02;* **G02b** *27/00*
**U.S. Cl. 356—106** **14 Claims**

The holographic interferometer makes use of the stored beam hologram for investigating a displaced or distorted object. Illumination of the stored beam hologram by the

distorted object beam will cause the generation of a distorted reference beam. The subject beam is now blocked off and the distorted reference beam is allowed to interfere with the original reference beam. This will yield an interferogram or fringe pattern corresponding to the object deformation.

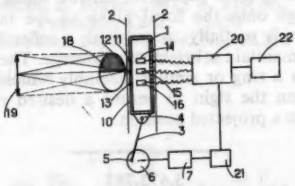


3,672,777

## APPARATUS FOR SENSING A CHANGE IN LIGHT INTENSITY

Helenio Llop, Creteil, France, assignor to Societe D'Optique Precision, Electronique et Mecanique-Sopelem, Paris, France

Filed Sept. 21, 1970, Ser. No. 73,998
Claims priority, application France, Oct. 30, 1969, 6937413
Int. Cl. G01n *21/46;* H01j *39/12*
U.S. Cl. 356—135 5 Claims



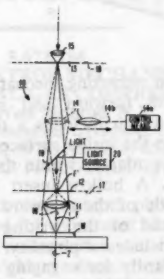
A refractometer in which the position of the change in intensity of the refractometer beam at the critical angle is sensed by a photoelectric sensor comprising an opaque screen defining two or three slits behind each of which a photoelectric cell is positioned, the outputs of the cells being supplied to an electronic circuit which provides a signal at the mean position of the change in intensity.

3,672,778

## OPTICAL SYSTEM FOR POSITIONAL AND ANGULAR ORIENTATION DETERMINING APPARATUS

Richard W. Kern, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1970, Ser. No. 96,417
Int. Cl. G01b *11/26*
U.S. Cl. 356—138 5 Claims



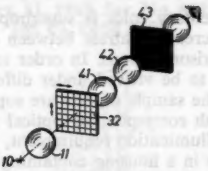
A selectively operative relay lens is provided in an optical system which is part of apparatus that determines the positional and angular orientation of an object with respect to a given reference system. When the relay lens is inoperative, the optical system provides an image that is indicative of the position of the object relative to two predetermined reference axes of the reference system and the angular orientation of the object relative to a third reference axis of the system, the three reference axes being mutually orthogonal with respect to each other. When the relay lens is operative, the optical system provides an image which is indicative of the angular orientation of the object relative to the first two mentioned reference axes.

3,672,779

## DEVICE FOR INDICATING THE POSITION OF TWO MECHANICAL ELEMENTS RELATIVE TO ONE ANOTHER

Fromund Hock, Wetzlar, Germany, assignor to Firma E. Leitz GmbH, Wetzlar, Germany

Filed May 17, 1971, Ser. No. 144,079
Claims priority, application Germany, May 22, 1970, P 20 24 919.8
Int. Cl. G01b *11/26*
U.S. Cl. 356—138 9 Claims



An indicating device comprises a record carrier plate consisting of information containing elements, such as sections of holograms, and of a diaphragm having at least one aperture corresponding in shape to the shape of one of the elements. The record carrier plate and the diaphragm are displaceable relative to one another, thereby revealing one or more elements by the diaphragm apertures. The revealed elements provide an information on the position of the record carrier plate relative to the diaphragm. In a first embodiment the elements are transparent and the record carrier plate is illuminated by transmitted light so that an image caused by the information containing element is projected through the aperture onto a screen or may be observed as a virtual image behind the record carrier plate. In a second embodiment the record carrier plate is illuminated by incident light which is reflected from the revealed element also to be projected onto a screen or viewed as a virtual image. The record carrier plate may be displaceable in one or in two directions of a rectangular system of coordinates. In the first case the elements are strips extending perpendicularly to the direction of movement and in the second embodiment the elements are of square shape.

3,672,780

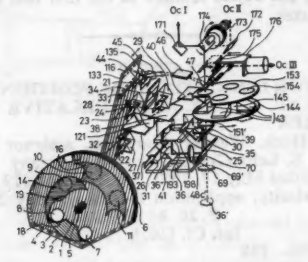
## METHOD AND DEVICES FOR THE DETERMINATION OF COLORS AND COLOR TOLERANCES IN A VISUAL MANNER IN ANY KIND OF ARTIFICIAL LIGHT OR SUNLIGHT

Fritz Piringer, Graf Starhemberggasse 13, Stiege 10, Vienna IV, Austria

Continuation of application Ser. No. 290,712, June 26, 1965. This application Mar. 26, 1970, Ser. No. 22,110
Int. Cl. G01j *3/48, 3/52*
U.S. Cl. 356—195 27 Claims

A visual comparison method and apparatus in which an image of a sample is presented in an image plane with a plurality of differing color comparison regions whose color attributes, i.e. hue, saturation and darkness can be

progressively adjusted so that the color of the sample can be visually compared with the comparison regions to establish color correspondence with one region. In order to facilitate such matching a number of proposals are provided: (1) either the sample image or the comparison regions are temporarily eliminated; (2) the sample image and the corresponding comparison region are replaced by a dull color; (3) the borderlines between the sample image and the comparison regions are periodically shifted;



(4) a complementary color is superimposed on the field of vision to increase contrast between the sample color and the comparison regions. In order to permit different sample objects to be viewed under different illumination requirements, the sample objects are supported in respective holders with corresponding optical devices providing the particular illumination requirement, the holders being interchangeable in a housing containing a viewer and the means for producing the color comparison regions.

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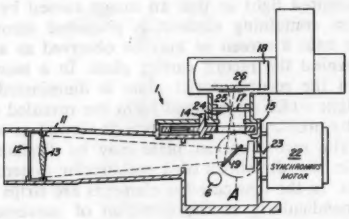
**3,672,781**

## CONTRAST PHOTOMETER

**Earl S. Rosenblum, Lexington, Mass., assignor to the United States of America as represented by the Secretary of the Army**

**Filed Mar. 3, 1970, Ser. No. 16,115**
**Int. Cl. G01n *21/22, 21/26***
**U.S. Cl. 356—201** **9 Claims**



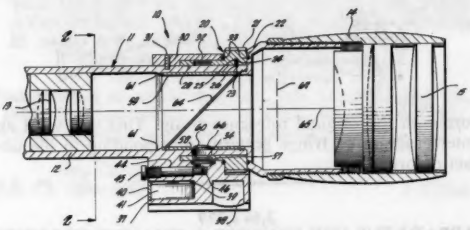
An apparatus and method for instrument determination of the effectiveness of military obscuration systems by the determination of the ratio of cloud reflectance to cloud transmittance as related to the visual contrast determined by a contrast photometer. The method and apparatus can also be utilized to observe industrial smoke clouds to ascertain whether or not particulate matter of the cloud exceeds the maximum allowable amount within pollution control standards. Aforementioned instrument determination and utility is accomplished by an apparatus and method which employs an optical system having an oscillating mirror means therein and a photomultiplier means therein; the mirror means being used to receive light waves from the source being studied by the photometer and to transmit the light waves to a photomultiplier means to convert the light waves into electrical impulses.

**3,672,782**

## RIFLESCOPE WITH MULTIPLE RETICLES SELECTIVELY PROJECTED ON A TARGET

**Alfred A. Akin, Jr., West Covina, Calif., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.**

**Continuation-in-part of abandoned application Ser. No. 769,136, Oct. 21, 1968. This application Feb. 22, 1971, Ser. No. 117,340**
**Int. Cl. G02b *27/34***
**U.S. Cl. 356—251** **5 Claims**



A firearm optical sight having a plurality of reticles which are selectably indexed and projected within the sight to appear as an illuminated reticle superimposed on a target image viewed by a shooter. A choice of many different reticles adapts the sight for use under varying lighting conditions and at varying range with different types of ammunition. A small battery-operated lamp projects the reticle on a beam-splitting device such as a partially transparent pellicle or mirror which reflects the reticle image onto the focal plane of the target image. The pellicle is partially coated with a reflection-reducing coating to maintain a bright target image. The reticles are mounted in a ring or similar assembly which is movably supported on the sight to permit a desired reticle to be indexed into a projected position.

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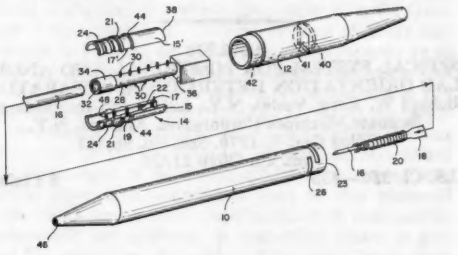
**3,672,783**

## TWIST-ACTION RETRACTING MECHANISM FOR USE IN WRITING INSTRUMENTS

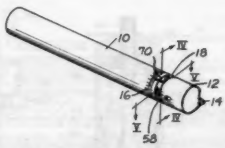
**Harold F. Bajusz, Woodbridge, N.J., assignor to Accutec, Inc.**

**Filed Aug. 25, 1970, Ser. No. 66,728**
**Int. Cl. B43k *24/06***
**U.S. Cl. 401—116** **17 Claims**



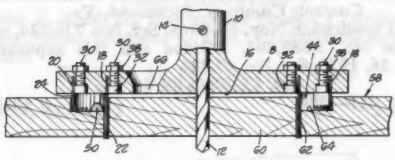
A twist-action retracting mechanism for use in writing instruments with forward and rearward barrels. The operating mechanism includes a tubular adapter having a helical slot on the inside surface and shaped to permit mounting of the adapter within the rearward end of the forward barrel. A hollow insert member is shaped to engage the inside of the rearward barrel and to receive the rearward end of the writing cartridge. The insert member also includes a plurality of discrete projections extending outwardly for engaging the helical slot of the adapter. Rotation of the insert member within the adapter causes axial movement of the insert member and the writing cartridge.

3,672,784
**ADJUSTABLE TOOL**
James F. McCreery, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.
Filed Aug. 26, 1970, Ser. No. 67,071
Int. Cl. B23b *29/02*
U.S. Cl. 408—178 15 Claims



The specification discloses an adjustable tool, specifically, a boring bar in which the tool has a first member adapted for being fixedly supported and a second member adjustable on the first member and adapted for supporting a cutting tool such as a hard insert. The two members are adapted for being fixedly clamped together and are adjustable relatively in a direction laterally of the axis thereof while cooperating elements of a cam and follower are carried by the respective members to effect said lateral adjustment.

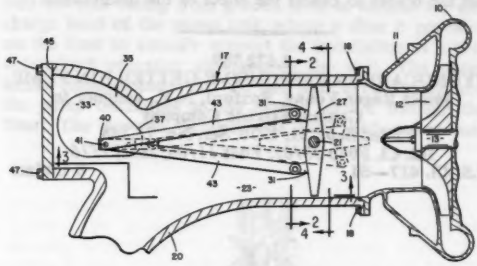
3,672,785
**CIRCULAR SAWING TOOL**
Joseph E. Byrne, 38623 E. 21st St., Palmdale, Calif. 93550
Filed June 24, 1970, Ser. No. 49,391
Int. Cl. B27b *33/18*
U.S. Cl. 408—206 2 Claims



A circular sawing device particularly for wood and other fibrous materials, as well as plastics, comprising a rotary body carrying at least a pair of concentric circular saw blades directed axially of the body and a pilot drill on the axis of rotation, wherein one circular blade is of lesser axial extent than the other, and whereby a circular opening with a rabbeted edge can be provided in one arrangement and in another blade arrangement, a circular disc with an inwardly concentric groove can be produced. Different adjustments of the blades can provide for various types of cuts other than the two mentioned.

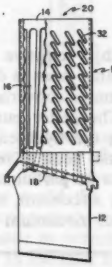
3,672,786
**CAPACITY CONTROL MECHANISM FOR CENTRIFUGAL GAS COMPRESSORS**
Gordon L. Mount, West Monroe, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Nov. 2, 1970, Ser. No. 85,937
Int. Cl. F04d *15/00, 27/00;* H01j *39/12*
U.S. Cl. 415—147 3 Claims

A pair of capacity control damper plates of semi-circular form are mounted for movement about a common pivot in the gas intake passage of a centrifugal compressor. The adjacent straight or diametrical edges of the plates extend normal to the axis of the pivot. A powered actuator is mounted upstream from the valve plates and is connected to the same by links. The plates are moved in unison in opposite directions about the pivot by the actuator, between positions wherein the plates extend



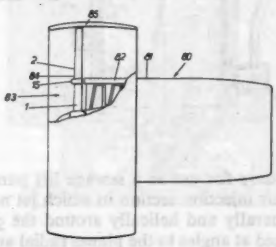
transversely across the passage and a position in which the plates are parallel with the passage.

3,672,787
**TURBINE BLADE HAVING A COOLED LAMINATED SKIN**
Rolf A. Thorstenson, Westport, Conn., assignor to Avco Corporation, Stratford, Conn.
Filed Oct. 31, 1969, Ser. No. 872,947
Int. Cl. F01d *5/08*
U.S. Cl. 416—97 11 Claims



A turbine blade is comprised of a core having open troughs enclosed by a laminated skin to form coolant passages. Each layer of the laminated skin has cooperating cavities which provide coolant flow passages through the skin. This results in the combination of convection cooling within the multi-layered laminated skin, and boundary layer cooling on the surface of the turbine blade.

3,672,788
**VARIABLE PITCH AEROFOIL BLADES**
John Henry Ellinger, Mickleover, Derby, England, assignor to Rolls-Royce Limited, Derby, England
Continuation of application Ser. No. 686,435, Nov. 29, 1967. This application May 4, 1970, Ser. No. 34,582
Claims priority, application Great Britain, Dec. 5, 1966, 54,417/66; June 24, 1967, 29,245/67
Int. Cl. B64c *11/34*
U.S. Cl. 416—43 13 Claims



Variable pitch aerofoil blades are provided with a gear drive having a feedback so that when the mechanism

reaches an equilibrium (feathered) condition any disturbance affecting the blade causes the gear drive to adjust the blades to cancel the effect of the disturbance.

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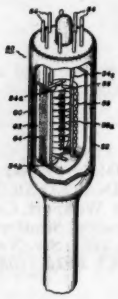
**3,672,789**
**HYDROCARBON RESPONSIVE GETTER ION PUMP**
**James Roger Young, Rexford, N.Y., assignor to General Electric Company**
**Filed Sept. 21, 1970, Ser. No. 73,848**
**Int. Cl. F04b** *37/02;* **F04f** *11/00;* **H01j** *7/16*
**U.S. Cl. 417—51** **8 Claims**



A getter pump which is sensitive to hydrocarbon gases as well as active inorganic gases is disclosed. The pump is particularly useful in image converter tubes having organic materials therein. The getter pump includes electrode means for dissociating the hydrocarbon gases into their atomic constituents and heating means to improve the gettering characteristics of particular porous getter materials such as titanium, zirconium, alloys of titanium and zirconium, or alloys of zirconium and aluminum.

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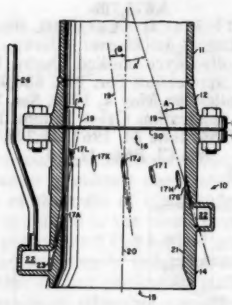
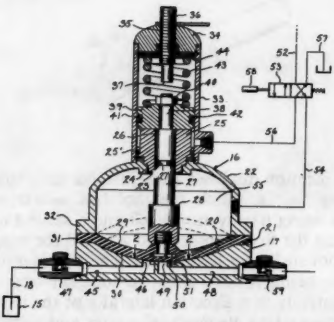
**3,672,790**
**AIR LIFT PUMP**
**Jessie N. White, Kensington, and Bernard Roseby, Burlingame, Calif., assignors to Berkeley Steel Construction Company, Inc.**
**Filed Apr. 15, 1971, Ser. No. 134,218**
**Int. Cl. F04f** *1/18, 5/00*
**U.S. Cl. 417—108** **6 Claims**



An air lift pump for use as a sewage lift pump is provided with an air injection section in which jet nozzles are disposed peripherally and helically around the pump section and arranged at angles to the planes radial and tangential to the longitudinal axis of the pump which vary when progressing peripherally around the pump section.

**3,672,791**
**PUMPING SYSTEM WITH CONTROLLED LIQUID ADDITION**
**Robert D. Zimmerly, Kenosha, Wis., assignor to Ladish Co., Cudahy, Wis.**
**Filed July 17, 1970, Ser. No. 55,885**
**Int. Cl. F04b** *23/08, 7/04, 21/02*
**U.S. Cl. 417—205** **4 Claims**



Liquids which are to be added in precise amounts to the suction side of a main pump in a liquid system are pumped from an additive tank by a special diaphragm pump which is so constructed and arranged that the diaphragm serves as a normally-closed, positive shut-off valve when the diaphragm pump is not operating to prevent excess chemical from being sucked into the system.

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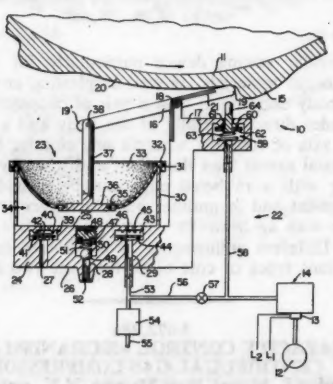
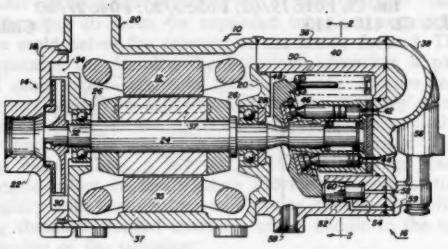
**3,672,792**
**PNEUMATIC CONTROL SYSTEM AND PARTS THEREFOR OR THE LIKE**
**Douglas R. Scott, Elkhart, Ind., assignor to Robertshaw Controls Company, Richmond, Va.**
**Original application Nov. 15, 1968, Ser. No. 776,224, now Patent No. 3,550,404. Divided and this application Aug. 26, 1970, Ser. No. 67,229**
**Int. Cl. F04b** *49/00*
**U.S. Cl. 417—306** **5 Claims**



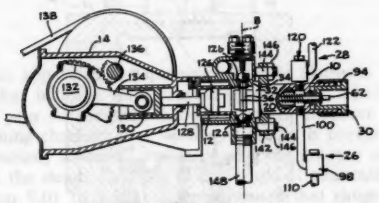
This disclosure relates to a laundry machine wherein the rotating laundry confining drum or tub is operatively interconnected to a vacuum pump to cause continuous operation of the vacuum pump during the entire movement of the confining means so as to provide a source of vacuum for controlling vacuum operated actuators of the apparatus. In addition, a pneumatically operated timer controlling the "on-off" operation of the laundry machine is repetitively actuated and deactuated by the movement of the laundry confining means.

3,672,793
**POWER TRANSMISSION**
Gordon H. Yowell, North Branch, Mich., assignor to Sperry Rand Corporation, Troy, Mich.
Filed Oct. 28, 1970, Ser. No. 84,697
Int. Cl. F04b 17/00; 35/00, 39/02, 24/14, 1/00, 27/00
U.S. Cl. 417—368 7 Claims



An electric motor-pump unit for hydraulic power systems has a pressure regulated variable displacement, high pressure pump at one end of an electric motor and a low pressure centrifugal charging pump at the opposite end. A path is provided from the low pressure pump through the electric motor to the inlet of the high pressure pump. To maintain a flow of charging fluid to cool the electric motor during periods when no high pressure fluid is required, the pressure responsive regulator for the high pressure pump opens a bypass from its delivery line into the casing to join the scavenged fluid.

3,672,794
**INJECTION PUMP**
Stanley E. Reed, Jr., Haslett, and Donald C. Ruby, Lansing, Mich., assignors to FMC Corporation, San Jose, Calif.
Filed Oct. 12, 1970, Ser. No. 79,849
Int. Cl. F04b 17/00, 35/00
U.S. Cl. 417—382 3 Claims

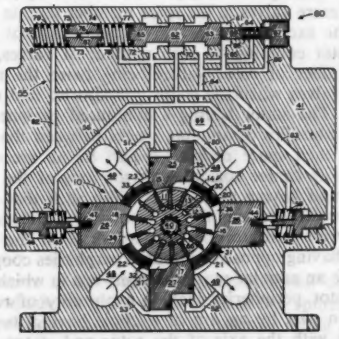


A piston type injection pump, having means for adjustment of the volume for each stroke, being powered synchronously by a reciprocating pump to inject a fluid in a set ratio by volume with the effluent of the reciprocating pump.

3,672,795
**CABLE-SUSPENDED, LINEAR-SUPPORTED ELECTRIC PUMP INSTALLATION IN WELL CASING**
Armais Arutunoff and John C. O'Rourke, Bartlesville, Okla., assignors to TRW, Inc., Cleveland, Ohio
Filed Feb. 4, 1971, Ser. No. 112,610
Int. Cl. F04b 17/00, 35/04; F03b 13/02
U.S. Cl. 417—424 6 Claims

A cable-suspended, submergible electric pump installation for use in a well casing, including concentrically connected pump, motor and motor protecting units. A retrievable cylindrical liner encircles the cable and extends into the well casing from ground level to enclose the discharge head of the pump unit, where a shoe is provided on the liner to actually support the installation at a predetermined operative elevation in the well. The pump intake communicates with the well fluid in the casing, and the pump discharges to the earth's surface through the liner. The annulus between the liner and casing acts as a gas separator. All electrical connections and splices are made in a low pressure zone effected by the pump intake, removed from the high pressure zone influenced by the pump discharge, to avoid the detrimental effects of high pressure on the connection and splices. The installation also includes means to permit the flushing of sand which may accumulate in the liner adjacent the pump discharge head.

3,672,796
**FLUID PRESSURE CONTROL**
Robert K. Mitchell, Hilliard, Ohio, assignor to The Battelle Development Corporation, Columbus, Ohio
Filed Oct. 12, 1970, Ser. No. 80,038
Int. Cl. F01c 21/16; F04c 15/04; F16k 11/00
U.S. Cl. 418—26 19 Claims



A pressure control for a fluid device such as a variable-delivery pump. A servo valve has an elongate opening

in which a control piston is longitudinally slidable about an equilibrium position where the forces of an adjustable compression spring and of the pump discharge pressure on a small surface at the right end are balanced by the discharge pressure on a larger surface at the left end. Increased discharge pressure moves the control piston to the right, applying the increased pressure to the flexible cam ring of the pump so as to reduce its eccentricity and the discharge rate. Decreased discharge pressure allows the control piston to move to the left, relieving pressure on the cam ring to increase its eccentricity and the discharge rate.

Oscillation of the control piston during changes in the discharge rate are substantially eliminated by a damping piston having a constricted longitudinal passage through it and positioned to the left of the control piston between compression springs. The space to the left of the damping piston communicates with a fluid pressure that is responsive to the eccentricity of the cam ring. As the control piston moves one way in response to a change in discharge pressure the damping piston moves in the opposite direction, thereby anticipatorily decelerating and minimizing overshoot by the control piston, which then returns to the equilibrium position as the damping piston moves oppositely to its equilibrium position and thus anticipatorily decelerate and minimizes oscillation by the control piston.

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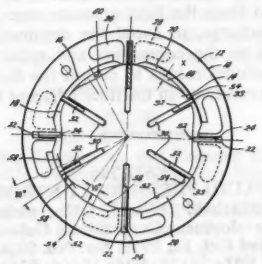
**3,672,797**

## FLUID POWER CONVERTER

**Charles R. Gerlach and Robinson W. Brown, San Antonio, Tex., assignors to Gerlach Brown, Inc.**

**Filed Dec. 10, 1969, Ser. No. 883,692**
**Int. Cl. F01c *1/00*; F03c *3/00*; F04c *1/00***
**U.S. Cl. 418—125** **11 Claims**



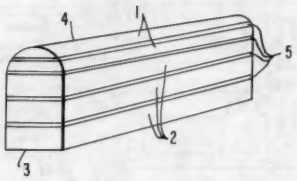
A fluid power converter, such as a hydraulic fluid pump or motor, having a rotor and stator each having sealing valves, which provides a zero radial bearing load by providing more valves in the rotor member than in the stator, with the excess of rotor valves being at least two when the stator contains an even number of valves, and with the number of rotor valves being twice the number of stator valves when the stator contains an odd number of valves. The stator having a contoured periphery to provide a plurality of annular spaces between the rotor and stator, each space defined in part by an arc of a circle having its center coaxial with the axis of the rotor and stator and having an angular width such that a constant net torque is exerted on both rotor valves and stator valves to provide zero torque fluctuation. Both the rotor and stator having opposed contoured perpheries cooperating to provide an annular space therebetween in which the stator and rotor peripheries include a plurality of recesses defined in part by an arc of a circle having its center coaxially with the axis of the rotor and stator and of an angular width such that a constant net torque is exerted on both rotor valves and stator valves to provide zero torque fluctuation.

**3,672,798**

## RADIAL SEALING BAR FOR PISTONS OF ROTARY PISTON INTERNAL COMBUSTION ENGINES

**Hans O. Scherenberg, Stuttgart-Heumaden, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany**

**Filed Mar. 6, 1970, Ser. No. 17,128**
**Claims priority, application Germany, Mar. 6, 1969, P 19 11 320.3**
**Int. Cl. F01c *19/02*; F03c *3/00*; F04c *27/00***
**U.S. Cl. 418—113** **7 Claims**




A radial sealing bar of composite construction for pistons of rotary piston internal combustion engines, especially of trochoidal construction in which the radial sealing bar consists of at least three thin layers which extend in the longitudinal direction; at least the layer which forms a part of the bar crest is made from a material having a high hardness, such as a ceramic material, quartz, a hard metal or alloy and other sintered materials.

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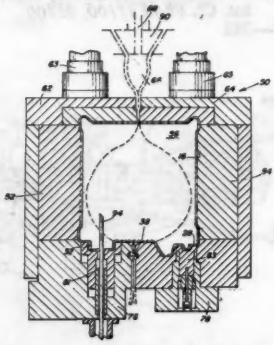
**3,672,799**

## APPARATUS FOR FORMING A STACKABLE CONTAINER

**Wolfgang Liebertz and Anthony J. Starr, Wilmington, Del., assignors to Container Corporation of America, Chicago, Ill.**

**Original application Sept. 18, 1968, Ser. No. 760,427. Divided and this application July 17, 1970, Ser. No. 55,740**
**Int. Cl. B29c *17/07*; B29d *23/03***
**U.S. Cl. 425—330** **2 Claims**



A unitary, stackable container is formed from moldable material and has integral top and bottom members interconnected by a hollow, tubular body and further comprises a stacking indentation in the bottom member, a pair of ridges upstanding from the top member and being adapted to engage the stacking indentation in the bottom member of a similar container when the containers are stacked, the top member having a pair of threaded, flanged apertures located adjacent the opposite sides of the member, a handle integrally formed with the top member and having its long axis positioned in a normal relationship with the axis extending through said apertures. The method of forming the above container includes the steps of suspending a tube of plastic material having one closed end and one open

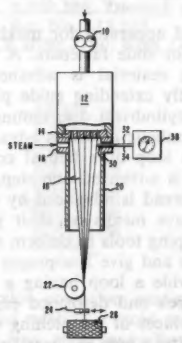
end between a pair of separated mold halves, introducing air into the tube through the open end for partially expanding the tube, enclosing the partially expanded tube in a cavity of the mold by bringing the mold halves into mating registry, completing the expansion of the tube by introducing air into the tube at a location other than the open thereby causing the tube to assume the configuration of the cavity, maintaining said expanded tube under internal air pressure for a predetermined time, exhausting air from the expanded tube, and separating the mold halves for removal of the article formed. The apparatus for forming the container comprises a pair of mold halves movable relative to one another into mating registry, a pair of article bottom forming plates positioned above the mold halves and movable relative to one another and into contacting engagement with the mold halves, a pair of article top forming plates located below the mold halves and movable into mating registry with one another and having cavities for forming threaded, flanged apertures and a handle in the top member of the container.

**3,672,800**

## GALVANIC DETECTION OF OXYGEN IN A SPINNING CELL STEAM CHAMBER

**Carmelo Rapisarda, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Filed July 1, 1970, Ser. No. 51,543**
**Int. Cl. D01d *13/02***
**U.S. Cl. 425—71** **2 Claims**




In an apparatus for spinning synthetic filaments of the type that includes an extrusion device from which filaments pass successively through a steam chamber and a quenching chamber to a windup, a means is provided for continuously detecting and indicating the amount of oxygen in the steam chamber in the range of concentrations of from 0.01 to 1.0% at temperatures that range from 100 to 350° C. The detecting means is a galvanic cell in communication with the steam chamber and connected to an indicator. The cell includes a porous graphite cup containing an electrolyte mixture and a molybdenum anode centrally located in the cup.

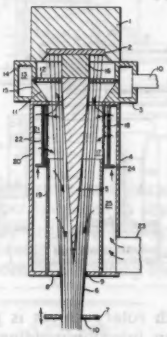
**3,672,801**

## SPINNING QUENCH CHAMBER HAVING A CONICAL FLOW DIRECTOR

**Gary Lee Caldwell, Wilmington, Del., and Richard Thomas Eger, Madison, and Frederick Warren Miller, Hendersonville, Tenn., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Filed Jan. 13, 1971, Ser. No. 106,022**
**Int. Cl. D01d *13/02***
**U.S. Cl. 425—71** **4 Claims**

A cylindrical chimney used for quenching synthetic filaments after they are extruded from a spinneret is divided into concentric cylindrical plenum and quenching chambers by means of a cylindrical foraminous member comprised of at least five layers of fine mesh screens spaced from each other a specified distance to improve quench medium distribution from the plenum into the quench chamber. A cone shaped flow director extends from the spinneret coaxially into the quenching chamber. A flow restrictor at the exit end of the quench chamber forms a partial seal with the filament bundle directing the air flow through the bundle for more efficient cooling. A guide positioned below the chimney quench chamber encompassing the filaments serves to stabilize the threadline and is vertically movable to vary the filament bundle size at the point it passes through the flow restrictor to vary the sealing effect of the bundle.

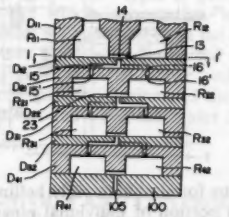


**3,672,802**

## APPARATUS FOR PRODUCING MULTILAYER FILAMENT

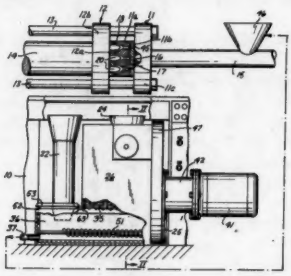
**Maso Matsui, Takatsuki, Yutaka Utsuhara, Higashi-Osaka, Masahiro Yamabe, Neyagawa, and Susuma Tokura, Osaka, Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan**

**Original application Mar. 6, 1968, Ser. No. 711,070. Divided and this application May 25, 1970, Ser. No. 48,683**
**Claims priority, application Japan, Mar. 15, 1967, 42/16,501**
**Int. Cl. D01d *3/00***
**U.S. Cl. 425—131** **7 Claims**



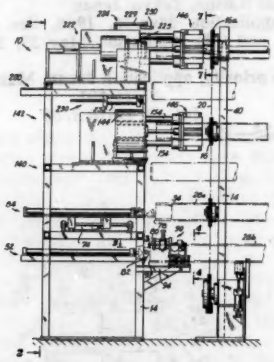
A spinneret is disclosed for the production of mixed filaments which are made from at least two spinning materials extending substantially continuously along the filament axis having at least ten thin layers in arbitrary cross section. The spinneret contains a plurality of layer multiplying mixers for separation and joining of the filament components in different phase.

3,672,803
**SCRAP GRINDER FOR INJECTION-MOLDING MACHINE**
Herbert Rees, Willowdale, Ontario, Canada, assignor to Husky Manufacturing and Tool Works Limited, Bolton, Ontario, Canada
Continuation-in-part of application Ser. No. 732,148, May 27, 1968, now Patent No. 3,566,444. This application May 13, 1970, Ser. No. 36,938
Int. Cl. B29f 1/00
U.S. Cl. 425—197 7 Claims



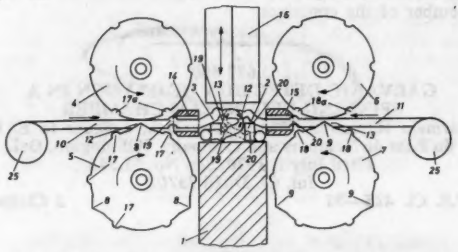
A grinder with rotary knives is positioned below the mold level of an injection-molding machine and offset from the mold path, an auger driven by the knife motor extending horizontally from a hopper beneath the mold path to the grinder mouth for delivering runners dropping from the opening mold to a lateral entrance of a knife housing. A lateral extension of that housing receives the comminuted scrap with the aid of a second auger, disposed at right angles to the first one, and has an outlet for the return of this scrap to the machine hopper via a suction pipe.

3,672,804
**PIPE BELLING MACHINE**
Herbert A. Dalik, Pemona, N.Y., assignor to The Flintkote Company, White Plains, N.Y.
Filed Oct. 12, 1970, Ser. No. 79,842
Int. Cl. B29c 17/00
U.S. Cl. 425—328 17 Claims



An apparatus for simultaneously belling the single wall thickened end portion of individual pipes supplied to the apparatus from an extruder with the thickened wall end portions thereof located at opposite ends of the successive pipes has a pick-up station for receiving the pipes from the extruder and a generally vertically extending conveyor which sequentially receives the pipes at the pick-up station and transports the pipes through a plurality of process stations including a pair of generally vertically spaced first process stations at which the both ends of the pipes are cleaned by a flow of air produced therein which is directed outwardly toward the pipe ends to remove debris therein while a line is simultaneously scribed on the peripheral surface of the spigot portion of the pipes at a predetermined position from the end thereof, a pair of generally vertically spaced second process stations at which the wall thickened end portions of the respective pipes are heated, and a pair of generally vertically spaced third process stations at which the heated wall thickened end portions of the respective pipes are belled prior to discharge from the apparatus.

3,672,805
**APPARATUS FOR FORMING A PLASTIC ARTICLE**
Bernd Porepp, Am Rebberg 16, Wangen 7764, Germany
Filed Dec. 8, 1969, Ser. No. 883,251
Int. Cl. B29d 5/00
U.S. Cl. 425—391 5 Claims



A method and apparatus for making continuous coupling elements for slide fasteners. A synthetic thread of a thermosetting material is advanced axially toward radially outwardly extending guide pins or teeth on the periphery of a cylindrical disc mounted for step-by-step rotation. The synthetic thread is advanced a length sufficient to form a loop of a helical coil, after which the cylindrical disc is advanced one step, or one guide pin. The synthetic thread is advanced by means of a pair of rollers which have means on their periphery or which coact with stamping tools to deform the synthetic thread at certain points and give it a proper shape. The shaped thread will provide a loop having a deformed coupling surface at its apex and deformed engaging surfaces for the coupling surfaces of a matching coupling element at the loop base. After a loop has been formed and advanced, it is stamped flat by a reciprocating stamping device and is then heated so as to become set. The cylindrical disc may also be provided with an additional set of guide pins on its periphery, offset from the first set of guide pins, so that two continuous coupling elements may be formed in engaging relationship simultaneously.

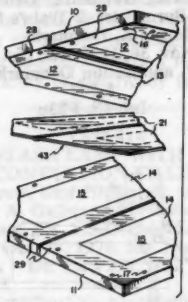
**ERRATUM**

For Class 425—364 see:
Patent No. 3,672,348

3,672,806
**DIE ASSEMBLY**
Peter T. Triolo and Harlan H. Schutte, Dubuque, Iowa, assignors to Scovill Manufacturing Company
Filed July 22, 1970, Ser. No. 57,096
Int. Cl. B29c 17/00
U.S. Cl. 425—406 7 Claims

A die assembly for forming and shaping articles from a moldable material by heat compressing the material between a pair of dies in which the dies comprise adjacent die units in side-by-side relationship to form a plurality of molded articles simultaneously and having a compressing member on one of the dies at the edges of the

units and spanning these edges to increase the density of the molded material at these edges. This compressing member not only densifies the edges of the article but



also restricts and thereby controls the rate of escape of volatile products from the moldable material that would ordinarily tend to rupture and weaken the molded product at the edges if the edges were not thusly densified.

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**3,672,807**

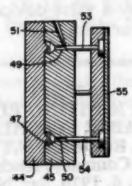
## MOLD CONSTRUCTION

**Orville F. Genz, Elmwood Park, Ill., assignor to Hydro Component Research and Development Co., Chicago, Ill.**

**Application July 23, 1969, Ser. No. 844,006, which is a division of application Ser. No. 643,236, June 2, 1967, now Patent No. 3,519,280. Divided and this application Feb. 8, 1971, Ser. No. 113,262**

**Int. Cl. B29c 7/00; B29f 1/14**

**U.S. Cl. 425—422** **3 Claims**



A mold construction comprises mating mold sections defining in assembled relation a mold cavity for forming an annular sealing ring of a generally V-shaped cross-section. The mold construction avoids the occurrence of mold parting lines and other surface irregularities on critical surfaces of the ring. A series of channels extend through one mold section and communicate with the mold cavity at the base of the V while a submerged gate communicates with at least one of the channels for providing a path to inject a thermoplastic material in a fluid state into the mold. A series of knock-out pins are each normally positioned at an end of the channel remote from the mold cavity but are slidable toward the cavity to shear the thermoplastic material communicating with the channel through the gate and to eject the ring member on disassembly of the mold.

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**3,672,808**

## METHOD AND APPARATUS OF CONTINUOUS STEAM-ATOMIZING FUEL COMBUSTION FOR BOILER FURNACE

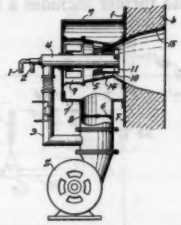
**Shuzo Miyazaki, Tokyo, Japan, assignor to Japan Furnace Industry Co. Ltd., Tokyo, Japan**

**Filed Oct. 15, 1970, Ser. No. 80,906**

**Int. Cl. F23n 1/04**

**U.S. Cl. 431—2** **10 Claims**

A method and apparatus for initiating combustion in a steam-atomizing furnace using the pressurized source of combustion air to atomize the fuel during startup when the steam pressure is insufficient to do so. A damper is provided in the air inlet to build up the air pressure upstream of the damper so that the latter air pressure may be directed through the atomizing nozzle. When the



furnace is up to temperature and steam is generated by the furnace, the damper is opened to obtain efficient combustion of the fuel which is then atomized by the steam. A supplemental air heater is provided to elevate the temperature of the pressurized air during the startup.

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**3,672,809**

## LIQUID FUEL BURNING HEATERS

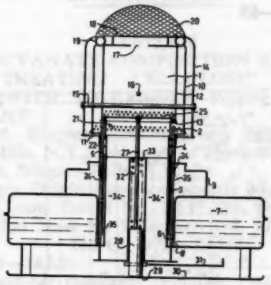
**Hugh Charles Hebard, Buchinghamshire, England, assignor to Aladdin Industries Limited, Greenford, Middlesex, England**

**Filed Feb. 12, 1971, Ser. No. 114,972**

**Claims priority, application Great Britain, Sept. 21, 1970, 44,773/70**

**Int. Cl. F23d 3/26**

**U.S. Cl. 431—34** **8 Claims**



A liquid fuel burning heater having a wick fed radiant burner of the "short drum" type, is provided with an extinguishing device which is operative, upon tilting of the heater, to retract the wick and close the space between the inner and outer wick tubes under the influence of a spring acting upon a rod, the upper end of which is secured to the extinguishing device and the lower end of which engages the ground when the heater is standing upright.

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**3,672,810**

## BURNER IGNITION AND CONTROL SYSTEM

**James A. Wright, Webster Groves, and Allan W. Lindberg, Kirkwood, Mo., assignors to Emerson Electric Co., St. Louis, Mo.**

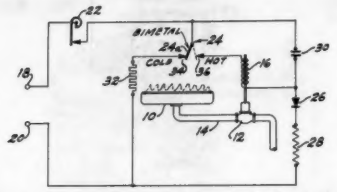
**Filed Aug. 18, 1970, Ser. No. 64,692**

**Int. Cl. F23n 5/00**

**U.S. Cl. 431—66** **7 Claims**

A direct ignition and control system for gaseous fuel burners employing an electrical resistance-type igniter, a biased closed solenoid actuated fuel valve, a double-throw switch normally completing an energizing circuit

for the igniter and responsive to the radiant energy of the igniter when at ignition temperature to break the igniter circuit and complete an energizing circuit for the winding of the valve solenoid; the valve circuit including a series resistor limiting current flow through the solenoid winding to that which holds the valve open but will not open it, and further includes a normally charged




capacitor which upon completion of the solenoid winding circuit by the double throw switch is discharged through the winding to effect opening of the valve; the double throw switch also being responsive to burner flame to retain completion of the valve hold open circuit and the igniter having sufficient mass to retain an igniting temperature for a brief period after de-energization.

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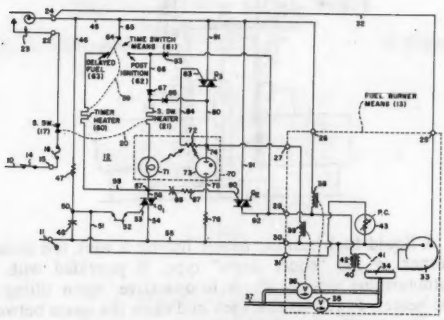
**3,672,811**

## BURNER CONTROL SYSTEM USING A RADIATION OPERATED RELAY MEANS

**Roland L. Hron, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Mar. 15, 1971, Ser. No. 124,128**
**Int. Cl. F23n *5/00***
**U.S. Cl. 431—69** **9 Claims**



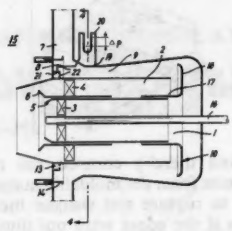

A substantially all solid state control system which is adapted to be connected to control a fuel burner is disclosed and provides a delayed fuel and post-ignition timing period using a heater operated bimetal switch. The system is adapted to be energized through a line voltage thermostat to provide power to a fuel burner means which may include two stages of fuel control, along with an ignition means and flame detection means. The system includes a main circuit means having triacs for control, and for operation of the valves that supply fuel to the fuel burner means. The switching between the triac stages is accomplished by a radiation operated relay means which includes two radiation sources and a radiation responsive means. The radiation operated relay means provides a solid state substitution for a more conventional type of relay.

**3,672,812**

## FUEL BURNER UNIT FOR MOUNTING IN A COMMON AIR BOX

**Knud Erik Bendixen, Horsholm, Denmark, assignor to Aktieselskabet Burmeister & Wain's Maskin- og Skibsbyggeri, Copenhagen K, Denmark**

**Filed Nov. 30, 1970, Ser. No. 93,625**
**Claims priority, application Denmark, Dec. 9, 1969, 6,507**
**Int. Cl. F23n**
**U.S. Cl. 431—89** **7 Claims**



A fuel burner unit designed to be connected to a common air supply box in parallel with one or more like burner units. The burner comprises a duct system for conveying combustion air from the air box to the burner head and includes a single annular outer duct connected at its front end to the air box and at its rear end to individual inner ducts for primary and secondary combustion air, respectively. The volume ratio between primary and secondary air is determined by an adjustable, but normally fixed baffle device at the rear outlet end of the outer duct. The total amount of combustion air supplied to each burner is controlled by a valve device located at the inlet end of the annular outer duct.

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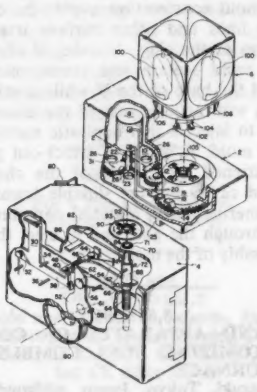
**3,672,813**

## ADAPTER FOR IGNITING ELECTRICALLY IGNITABLE FLASHLAMPS

**William H. Horton, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Feb. 6, 1970, Ser. No. 9,209**
**Int. Cl. F21k *5/02***
**U.S. Cl. 431—95** **4 Claims**



An adapter for enabling a percussion flash camera to receive and actuate electrically ignitable flashlamps. The adapter includes a piezoelectric device for generating flashlamp ignition voltage in response to operation of the camera flash actuating means. The actuating means can

strike the piezoelectric device directly, or release a percussive element for striking the device. In one embodiment, the adapter has a rotatable socket for receiving a conventional multilamp flash holder and for sequentially presenting a fresh flashlamp in a firing position in response to the actuation of camera indexing means. In another embodiment, the adapter receives a multilamp flash unit having a linear array of electrically ignitable flashlamps.

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3,672,814

**PHOTOFLASH LAMP WITH YTTRIUM COMBUSTION FILLING**

Kenneth F. Andrew, East Pittsburgh, and Richard L. Tallman and Earl A. Gulbransen, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 30, 1970, Ser. No. 85,513
Int. Cl. F21k *5/02*
U.S. Cl. 431—95 6 Claims

An improved combustible photoflash lamp is described wherein the combustible metal foil is yttrium metal. The rise time characteristic to peak light output is significantly improved by the use of the yttrium combustible metal. The addition of varying amounts of yttrium metal to standard combustible metal such as zirconium also improves the rise time to peak light output characteristic for these lamps.

# CHEMICAL

3,672,815

**PROCESS FOR DYEING MIXTURES OF POLYESTER AND POLYACRYLONITRILE FIBERS IN ONE BATH**

Hans-Ulrich von der Eltz, Frankfurt am Main, Johannes Jeths, Weiskirchen, and Alfons Bernhard Boecker, Kelkheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Brüning, Frankfurt am Main, Germany

No Drawing. Filed Feb. 24, 1970, Ser. No. 14,753
Claims priority, application Germany, Feb. 26, 1969, P 19 09 517.1
Int. Cl. D06p *3/82*
U.S. Cl. 8—21 A 6 Claims

Process for the single-bath dyeing of mixtures made of polyester and polyacrylonitrile fibers simultaneously with disperse dyestuffs and cationic dyestuffs according to the thermosol method wherein non-ionic dispersing agents are added to the acidic padding baths which contain the cationic dyestuff in dissolved form.

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3,672,816

**PROCESS FOR DYEING SYNTHETIC POLYAMIDE TEXTILES WITH DISAZO DYESTUFFS**

Johannes Dehnert, Ludwigshafen, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed July 9, 1970, Ser. No. 53,682
Claims priority, application Germany, July 10, 1969, P 19 35 004.0
Int. Cl. D06p *1/02*
U.S. Cl. 8—41 B 3 Claims

Process for the fast dyeing of synthetic polyamides with disazo dyes derived from 4,4' - diamino-stilbene-2,2'-disulfonic acid as diazo component and a phenol or phenols as coupling component.

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3,672,817

**ALKYLENE CHLOROHYDRIN, OXIDE OR CARBONATE MODIFIED SULFONATED LIGNINS IN A DISPERSE OR VAT DYE CAKE**

Sten I. Falkehag, Mount Pleasant, and Howard H. Moorer, Gerald Prazak, and Carl W. Bailey III, Charleston, S.C., assignors to Westvaco Corporation, New York, N.Y.

No Drawing. Filed Dec. 14, 1970, Ser. No. 98,164
Int. Cl. C09b *67/00*
U.S. Cl. 8—79 7 Claims

Dyestuff compositions comprising an admixture of a dye cake, i.e., disperse dyes and vat dyes, and up to 75% by weight of an improved sulfonated lignin surfactant. The improved sulfonated lignin surfactant is the hydroxyalkylated adduct made by reacting with lignin up to 20 moles, preferably from 1 to 10 moles (per 1000 grams of lignin), of a reactant such as an alkylene oxide, a halogen-containing alkyl alcohol or an alkylene carbonate. The preferred reactants include ethylene oxide and 2-chloroethanol. These improved sulfonated lignin adducts are lighter in color, and lessen or eliminate fiber staining, diazo dye reduction and foaming problems.

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3,672,818

**POLYISOCYANATE COMPOSITION AND PROCESS FOR TREATING CELLULOSIC MATERIALS THEREWITH TO RENDER THEM WATER REPELLANT**

George M. Wagner, Lewiston, and William J. Vullo, Burnt Hills, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Original application July 30, 1969, Ser. No. 846,283, now Patent No. 3,617,189. Divided and this application Nov. 25, 1970, Ser. No. 92,856
Int. Cl. D06m *13/42*
U.S. Cl. 8—116.2 6 Claims

A method for rendering cellulosic materials water-repellent by contacting the cellulosic material to be treated with an emulsion formed by a soap, a surface active agent and a polyaryl polyisocyanate containing at least three aryl groups and an average of at least three isocyanate groups, a portion of which may be modified by reaction with an alcohol, thioalcohol, organic acid, amine or amide, and thereafter curing the treated material with water.

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3,672,819

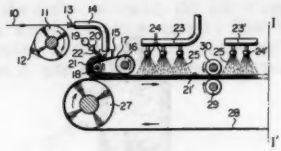
**PROCESS FOR SHAPING A BUNDLE OF WET-SPUN CONTINUOUS FILAMENTS**

Shigeo Katsuyama, Atsumi Asami, Masahide Watanabe, Tsutomu Sato, Toshiaki Norimatsu, and Eizo Nakajima, Miyazaki-ken, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 2, 1969, Ser. No. 881,345
Claims priority, application Japan, Dec. 3, 1968, 43/88,229
Int. Cl. B08b *3/00*
U.S. Cl. 8—137 4 Claims

A process for the shaping of wet-spun continuous multifilament bundles wherein said bundles are arranged

in a plurality of elongated and parallel fleece mat strips on a pervious endless belt, each of said strips having a



thickness of at least 5 mm. and 100–1,000 crossings of multifilament bundles.

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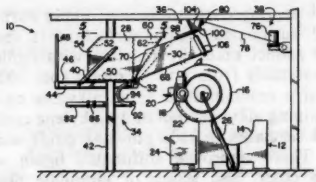
**3,672,820**

## LOADING STRUCTURE AND METHOD FOR LAUNDRY MACHINES

**Alex Toth, Lincolnwood, and Robert H. Fesmire, Barrington, Ill., assignors to Ellis Corporation, Chicago, Ill.**

**Filed Dec. 7, 1970, Ser No. 95,849**
**Int. Cl. D06f *39/00***
**U.S. Cl. 8—150** **9 Claims**



A commercial laundry machine receives a prewetted laundry load from a hopper by way of a transfer chute. The initially dry load is placed into a hopper while the hopper is in an upright position, and the hopper is supplied with liquid in order to wet the load. A pivotally mounted transfer chute is normally spaced from the machine to permit access, unloading and the like. The chute is pivoted into loading position wherein it is disposed at an acute angle relative to horizontal, and the hopper is pivoted about the same axis to discharge the laundry load into the chute. The cohesive wet load slides at a controlled low velocity from the hopper along the chute and into the machine. Liquid supplied during transfer reduces friction, and a paddle member assures complete emptying of the load into the machine.

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**3,672,821**

## INHIBITOR FOR ALUMINUM IN ALKALINE SOLUTIONS

**Hans-Joachim Schlussler, Dusseldorf-Holthausen, Germany, assignor to Henkel & Cie GmbH, Dusseldorf, Germany**

**No Drawing. Continuation of abandoned application Ser. No. 768,516, Oct. 17, 1968. This application Feb. 16, 1971, Ser. No. 115,756**
**Int. Cl. C23f *11/06***
**U.S. Cl. 21—2.7** **2 Claims**

A method of inhibiting the corrosion of metallic aluminum during its treatment with alkaline solutions. As the inhibitor in the alkaline solution, according to the invention polyacrylic acids having a specific viscosity in the range of 0.07 to 0.90, preferably 0.09 to 0.20, are used in a preferred amount of 0.05 to 0.5% by weight, based on the weight of the alkaline solution. Instead of the polyacrylic acids their water-soluble alkali salts can be used.

By the present invention the undesired side effects of alkali silicate inhibitors, such as incrustation of the aluminum, can be avoided.

**3,672,822**

## CORROSION INHIBITING ENVIRONMENT FOR ALUMINUM

**Willem Vedder, Latham, and David A. Vermilyea, Schenectady, N.Y., assignors to General Electric Company**

**No Drawing. Filed Dec. 3, 1969, Ser. No. 881,854**
**Int. Cl. C23f *11/02***
**U.S. Cl. 21—2.5** **3 Claims**

Aluminum can be protected against corrosion by providing a vapor phase inhibiting environment for the aluminum comprising a hydrolyzable volatile organic phosphate.

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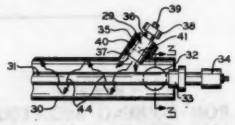
**3,672,823**

## METHOD OF STERILIZING LIQUIDS

**Raymond Marcel Gut Boucher, New York, N.Y., assignor to Wave Energy Systems, Inc., New York, N.Y.**

**Filed Mar. 25, 1970, Ser. No. 22,419**
**Int. Cl. A61l *1/00, 3/00***
**U.S. Cl. 21—54 R** **3 Claims**



Improved, economical method for the continuous or batch sterilization of bacteriologically contaminated liquids at increased liquid flow rates by means of the synergistic effects produced during the simultaneous and combined action of ultraviolet flux and high intensity acoustic waves in the sonic or ultrasonic range. The method involves the use of ultraviolet irradiation within the 1800 A. to 4500 A. region with intensities equal to at least 1 watt per square foot of processed area in air and 16,000 micro-watt seconds per cm.$^2$ in liquids while simultaneously subjecting the liquid to an acoustic field having a frequency of the order of between 5 and 150 kHz. and an average acoustic energy density level equal at least to 1 watt per liter in the processing chamber.

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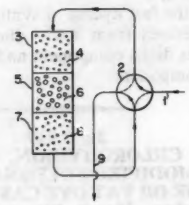
**3,672,824**

## METHOD FOR OXIDIZING CARBON MONOXIDE CONTAINED IN ROOM AIR

**Takaaki Tamura, Tokyo, and Tsutomu Kato, Hamamatsushi, Japan, assignors to Kachita Co., Ltd., Shizuoka-ken, Japan**

**Filed June 16, 1969, Ser. No. 833,285**
**Claims priority, application Japan, June 20, 1968, 43/42,374; Oct. 16, 1968, 43/74,952**
**Int. Cl. B01d *53/34***
**U.S. Cl. 23—4** **7 Claims**



Where carbon monoxide contained with moisture in room air is converted to harmless carbon dioxide using an oxidation catalyst mixed with natural zeolite, it has been discovered that if there is provided, before and after the catalyst chamber, demoistening chambers filled with a desiccant such as active alumina or natural zeolite, and said gas is allowed to pass through these three chambers

first to one direction and thereafter in the opposite direction, continuously repeating said gas passage operation by turns, then the aforementioned catalyst will be possible to display an effect of efficiently eliminating carbon monoxide over a long period without reducing its catalytic action.

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3,672,825

## PROCESS FOR PREPARING BASIC ZIRCONIUM SULFATES AND OTHER ZIRCONIUM COMPOUNDS SUCH AS ZIRCONIUM FLUOSULFATES, AND COMPOSITIONS CONTAINING THE SAME

James Richard Gambale, Media, Pa., and Glenn Hazel McIntyre, Jr., and Fredrik J. Ranney, Pennington, N.J., assignors to Tizon Chemical Corporation, Flemington, N.J.

Filed Feb. 16, 1970, Ser. No. 11,624
Int. Cl. C22b *59/00*
U.S. Cl. 23—15 R 12 Claims

A process is provided for preparing zirconium sulfates by fusing a zirconium siliceous ore, such as zircon sand, with an alkali metal carbonate or hydroxide to form an alkali metal zirconylosilicate, and/or alkali metal zirconate, and silicate, which is dissolved in aqueous hydrochloric acid to form a clear solution of zirconyl chloride and silicic acid. An aqueous sulfate solution is added, and the mixture heated to precipitate a zirconium sulfate. This can be calcined to form zirconium oxide. If fluoride is added with the sulfate solution, a series of basic and acidic zirconium fluosulfates can be obtained useful as a glass polishing additive. The zirconium fluosulfates can also be calcined, to form a very pure zirconium oxide.

A process also is provided for preparing a zirconium oxide having a very low proportion of silica, by calcining a zirconium compound comprising silica in the presence of fluorine or a fluoride.

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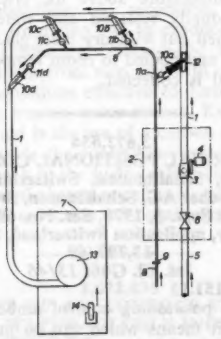
3,672,826

## PROCESS FOR THE HYDRATION OF SODIUM TRIPOLYPHOSPHATE

Hans Werner Hornig and Kurt Walz, Mannheim, Germany, assignors to Lever Brothers Company, New York, N.Y.

Filed Dec. 22, 1969, Ser. No. 887,258
Claims priority, application Germany, Dec. 24, 1968, P 18 16 839.3
Int. Cl. C01b *25/30*
U.S. Cl. 23—106 7 Claims



Sodium tripolyphosphate in particulate form is at least partially hydrated by contact with steam during its pneumatic conveyance. An apparatus for accomplishing the process comprises a pipe, at least one inlet thereto for a carrier gas and for the particulate sodium tripolyphosphate, at least one inlet for admitting steam to the pipe at a point or points past which the sodium tripolyphosphate is conveyed by the carrier gas and an exit from the pipe for the hydrated sodium tripolyphosphate and the carrier gas. The apparatus may be coupled to a detergent slurry-making apparatus for direct dosing of the hydrated sodium tripolyphosphate into a slurry-mixer.

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3,672,827

## SODIUM PHOSPHATE RECOVERY PROCESS

Duane L. Sawhill, Orange, Conn., assignor to Olin Corporation

No Drawing. Filed Dec. 14, 1970, Ser. No. 98,134
Int. Cl. C01b *25/30*
U.S. Cl. 23—107 5 Claims

Soluble phosphate values are recovered from the by-product insoluble phosphates precipitated when wet process phosphoric acid is partially neutralized in the manufacture of sodium phosphate. A mixture of soda ash with the insoluble phosphates is calcined and the soluble phosphates are leached out. The extract is purified to remove aluminum and fluorides. Suitably the purified extract is recycled to the sodium phosphate producing process or used for the recovery of solid sodium phosphates.

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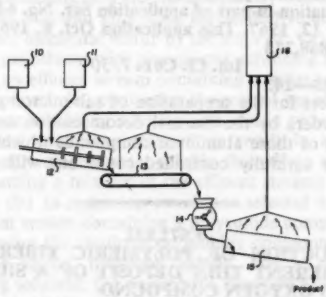
3,672,828

## QUICK CURE PROCESS FOR MAKING SUPERPHOSPHATES OF LOW FLUORINE CONTENT

Albert E. Henderson, Jr., 4308 Plaza Gate Lane, Apt. 101, Jacksonville, Fla. 32217

Continuation-in-part of application Ser. No. 688,928, Dec. 7, 1967, now Patent No. 3,519,387, dated July 7, 1970. This application Feb. 3, 1970, Ser. No. 8,306
The portion of the term of the patent subsequent to July 7, 1987, has been disclaimed
Int. Cl. C01b *7/22, 25/32;* C05l *1/00*
U.S. Cl. 23—109 9 Claims



A method of making a quick cure low fluorine superphosphate by simultaneously and separately heating phosphate rock and mineral acid and then bringing the heated rock and acid together with rapid agitation to react the two to release fluorine and form a superphosphate product.

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3,672,829

## SODIUM DITHIONITE SOLUTION STABILIZATION

Mearl A. Kise, Portsmouth, and Leonard C. Ellis, Chesapeak, Va., assignors to Virginia Chemicals, Inc., Portsmouth, Va.

No Drawing. Filed Jan. 16, 1970, Ser. No. 3,526
Int. Cl. C01b *17/66*
U.S. Cl. 23—116 2 Claims

Sodium dithionite in aqueous solution is widely used in bleaching and vat dyeing of textiles. Unfortunately, however, losses occur not only through decomposition during dissolving of the salt in question, but also during storage of the solution.

It has been discovered that the losses by decomposition in a 5% aqueous solution can be significantly reduced by

the addition of approximately 0.2% zinc sulfate. Here the rate of anaerobic decomposition in the protected sodium dithionite solution was decreased to 6% of the rate for an unprotected system. As to the stronger grades of the bleaching solution, viz: 15.0% to 17.7% by addition of 1.6% zinc sulfate, the anaerobic decomposition rates were reduced to 25% to 80% of those for unprotected bleaching solutions in storage.

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**3,672,830**

## ZINC SULFIDE PIGMENT AND METHOD OF MAKING SAME

**John H. Calbeck, Pratt, Kans.; by J. R. Calbeck, trustee of the W. J. Trust, Pratt, Kans.**

**Continuation-in-part of application Ser. No. 338,244, Jan. 16, 1964, now Patent No. 3,443,888. This application May 5, 1969, Ser. No. 821,937**

**Int. Cl. C01g *9/08***

**U.S. Cl. 23—135** **4 Claims**

The method of the invention provides a new zinc sulfide pigment having a particular shape predominately lamellar, and being of a thickness less than the planar dimensions. To produce such a thiosulfate type zinc sulfide, pigment particles are subjected to a triturating grind with classification preferably in a pebble grinding mill turning at a relatively slow speed, and operating so as not to cascade or tumble the particles, and to subject the pebbles to a rolling motion.

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**3,672,831**

## PROCESS FOR THE PREPARATION OF FINE-SIZED ALUMINAS

**Heyman C. Duecker, 10097 Colonial Drive, Ellicott City, Md. 21043, and Rimantas Glemza, 6105 Burnt Oak Road, Baltimore, Md. 21228**

**Continuation-in-part of application Ser. No. 645,231, June 12, 1967. This application Oct. 8, 1969, Ser. No. 868,275**

**Int. Cl. C01s *7/30***

**U.S. Cl. 23—143** **4 Claims**

A process for the preparation of sub-micron sized alumina powders by the thermal decomposition and/or dehydration of those aluminum compounds which on heating under carefully controlled conditions will yield the oxide.

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**3,672,832**

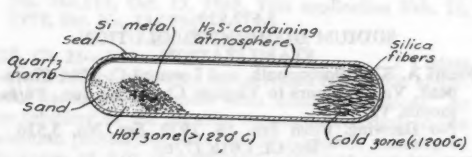
## PRODUCTION OF POLYMERIC FIBERS OR COHERENT THIN DEPOSIT OF A SILICON AND OXYGEN COMPOUND

**James O. Huml and Gilbert S. Layne, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Continuation-in-part of abandoned application Ser. No. 691,430, Dec. 18, 1967. This application July 16, 1970, Ser. No. 55,590**

**Int. Cl. C01b *33/18, 35/14***

**U.S. Cl. 23—182 V** **11 Claims**




Polymeric silica is condensed as fibers on a polycrystal substrate or as a microfilm on a single crystal substrate by reacting a mixture consisting of a sulfur source, an oxygen source, a silicon source, and a hydrogen source, and optionally an inert carrier gas, in a suitable single or multiple-chambered closed reaction vessel equipped with a heating means for one portion or one chamber of the vessel and preferably a cooling means for another portion or chamber of the vessel, maintaining temperature and pressure conditions such that a volatile intermediate is formed in the heated portion or chamber and maintaining a temperature at least 20 centigrade degrees less, when at about one atmosphere pressure, in the cooler portion or cooler chamber, whereby $SiO_2$ fibers or a microfilm is formed by decomposing said volatile intermediate in the cooler portion of a single chamber or the cooler chamber of multiple chambers.

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**3,672,833**

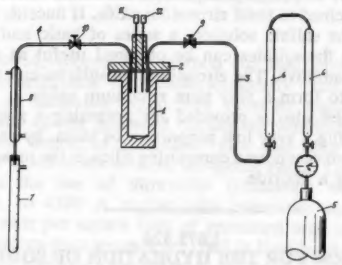
## METHOD OF PREPARING INORGANIC AEROGELS

**Stanislas Jean Teichner and Gilbert Andre Nicolaon, Lyon, France, assignors to Etat Francais represente par le Ministre des Armees Delegation Ministerielle pour l'Armement, Paris, France**

**Continuation-in-part of application Ser. No. 779,976, Nov. 29, 1968. This application Feb. 8, 1971, Ser. No. 113,246**

**Int. Cl. C01b *33/16, 33/14***

**U.S. Cl. 23—182 R** **20 Claims**



Silica aerogels are prepared by hydrolyzing a lower alkyl orthosilicate in an aliphatic alcohol having 1–4 carbon atoms with one to five times the stoichiometric quantity of water required to effect hydrolyzation. In a separate vessel, a supplementary amount of the same alcohol is added and the contents of both vessels are gradually heated to a temperature above the critical point. The pressure is gradually released and water and alcohol vapors are washed out with dry inert gas. The autoclave is then resealed and cooled to room temperature and the resulting aerogel is collected.

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**3,672,834**

## NUMERICAL POSITIONAL CONTROL

**Klaus Corbacu, Schaffhausen, Switzerland, assignor to Georg Fischer AG, Schaffhausen, Switzerland**

**Filed Sept. 3, 1970, Ser. No. 69,211**

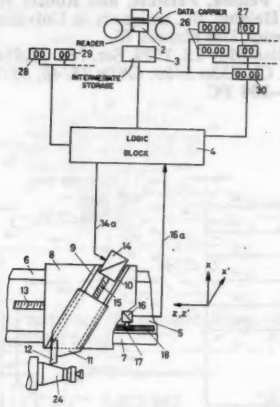
**Claims priority, application Switzerland, Sept. 12, 1969, 13,787/69**

**Int. Cl. G06f *15/46***

**U.S. Cl. 235—151.11** **8 Claims**

A numerical positioning control embodying a digital computer circuit means which can be influenced in sets by a program, this digital computer circuit means serving to generate a feed control signal for a second displaceable unit as a function of a signal corresponding to the independent feed of a first displaceable unit. The aforementioned computer circuit means determines during the duration of each program set, the path slope in the form of a ratio between both mentioned signals. Further, the digital computer circuit means embodies switching means which can be influenced in sets by the program and which, for

the purpose of describing curved path sections, brings about during the duration of the set, automatic continuous




changes of the programmed starting values of the path slope.

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**3,672,835**

**TREATMENT OF AN AQUEOUS WASTE STREAM FROM A HYDROCARBON CONVERSION PROCESS**

**Peter Urban, Northbrook, and Robert H. Rosenwald, Western Springs, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.**

**Filed Aug. 31, 1970, Ser. No. 68,275**

**The portion of the term of the patent subsequent to Oct. 27, 1987, has been disclaimed**

**Int. Cl. C01b** *17/02*

**U.S. Cl. 23—224** **18 Claims**

An aqueous waste stream containing $NH_4HS$, which is typically produced in a process for converting a hydrocarbon charge stock containing sulfurous and nitrogenous contaminants, is treated to produce elemental sulfur and a treated water stream suitable for recycle to the hydrocarbon conversion process, by the steps of: (a) catalytically treating the aqueous waste stream with oxygen at oxidizing conditions effective to produce an effluent stream containing $NH_4OH$, $(NH_4)_2S_2O_3$ and elemental sulfur or ammonium polysulfide; (b) separating sulfur from the effluent stream from step (a) to produce an aqueous effluent stream containing $(NH_4)_2S_2O_3$; and (c) treating the aqueous stream from step (b) with carbon monoxide at reduction conditions effective to form a substantially thiosulfate-free treated water stream. Key feature of the treatment method is the use of a carbon monoxide reduction step to enable the continuous recycle of the treated water stream back to the hydrocarbon conversion process with consequential abatement of water pollution problems and substantial reduction of requirements for make-up water.

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**3,672,836**

**TREATMENT OF AN AQUEOUS STREAM CONTAINING WATER-SOLUBLE INORGANIC SULFIDE COMPOUNDS**

**Kenneth M. Brown, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.**

**Continuation-in-part of application Ser. No. 767,312, Oct. 14, 1968. This application Dec. 21, 1970, Ser. No. 99,859**

**Int. Cl. C01b** *17/06*

**U.S. Cl. 23—224** **19 Claims**

An aqueous stream containing a water-soluble, inorganic sulfide compound is treated by contacting the aqueous stream and oxygen, in an amount selected to react less than 0.5 mole of $O_2$ per mole of sulfide compound, with a first oxidizing catalyst at oxidizing conditions, including a relatively low pressure and temperature, selected to form an effluent stream containing a water-soluble polysulfide; and thereafter by contacting the polysulfide-containing effluent stream and oxygen in an amount less than the amount utilized in the first step, with a second oxidizing catalyst at oxidizing conditions, including a temperature greater than or equal to the melting point of sulfur and a pressure sufficient to maintain at least a portion of the effluent stream in the liquid phase, selected to produce liquid sulfur and a substantially sulfide-free treated water stream. Key features of the disclosed method involve the use of a first catalytic oxidation step which is run at relatively low temperatures and pressures to produce polysulfide, coupled with a second catalytic oxidation step which is run at relatively high temperatures and pressures to selectively oxidize the polysulfide to elemental sulfur, thereby preventing the deposition of elemental sulfur on the catalyst used during these oxidation steps while simultaneously minimizing the amount of oxygen which must be supplied at the relatively high pressures.

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**3,672,837**

**PROCESS FOR TREATING TWO GAS STREAMS**

**Peter Urban, Northbrook, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.**

**Filed Oct. 1, 1970, Ser. No. 77,082**

**Int. Cl. C01b** *17/14*

**U.S. Cl. 23—225** **14 Claims**

A first gas stream containing $H_2S$ and a second gas stream containing $SO_2$ are simultaneously treated in order to remove $SO_2$ and $H_2S$ from the respective streams and to produce elemental sulfur by the steps of: (a) scrubbing the first gas stream with an aqueous scrubbing solution to produce an effluent stream containing a water-soluble sulfide compound; (b) contacting the second gas stream with an aqueous scrubbing solution and with a reducing agent at reaction conditions selected to result in an effluent stream containing a water-soluble thiosulfate compound; (c) subjecting a mixture of the effluent streams from step (a) and (b) to reduction conditions selected to result in an effluent stream containing a polysulfide compound; (d) decomposing the resulting polysulfide compound to form elemental sulfur, hydrogen sulfide, and a regenerated scrubbing solution; (e) passing the resulting hydrogen sulfide to step (a); and (f) recirculating the regenerated scrubbing solution to steps (a) and (b).

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**3,672,838**

**ANALYTICAL METHOD AND APPARATUS USING DIFFUSION ACROSS A BOUNDARY BETWEEN LIQUIDS**

**Ronald Trcka, Berwyn, and Paul H. Sherrick, Winnetka, Ill., assignors to Sargent-Welch Scientific Company, Skokie, Ill.**

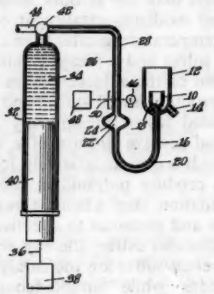
**Continuation-in-part of application Ser. No. 787,900, Dec. 30, 1968, which is a continuation-in-part of application Ser. No. 544,165, Apr. 21, 1966. This application Sept. 10, 1970, Ser. No. 71,202**

**Int. Cl. G01n** *13/00, 21/24, 33/16*

**U.S. Cl. 23—230 R** **19 Claims**

A method of, and apparatus for, obtaining a quantitative indication of a constituent in a liquid, for example, a crystalloidal constituent such as glucose in blood, in its mixture with other materials, which involves bringing a constituent carrying liquid into contact with another liquid to form a relatively stable boundary between the liquids, allowing diffusion to occur across the boundary,

and, without disrupting the boundary, conveying the the boundary to an analyzing zone where a measurement is obtained which is indicative of the concentration of the constituent in the constituent carrying liquid. Colorimetric or photometric techniques advantageously are employed



in making the measurement, and the transmittance change at, or proximal to, the boundary desirably is registered by an electrical signal which can be used to energize suitable recording devices to provide visual data relative to the concentration of the constituent in the constituent carrying liquid.

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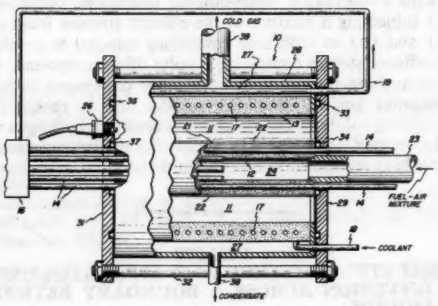
**3,672,839**

## BURNER-COOLER SYSTEM FOR GENERATING EXOTHERMIC GAS

George E. Moore, Scotia, N.Y., assignor to General Electric Company

Filed Jan. 28, 1971, Ser. No. 110,392
Int. Cl. B01j 7/00; F23d 13/16
U.S. Cl. 23—281 6 Claims



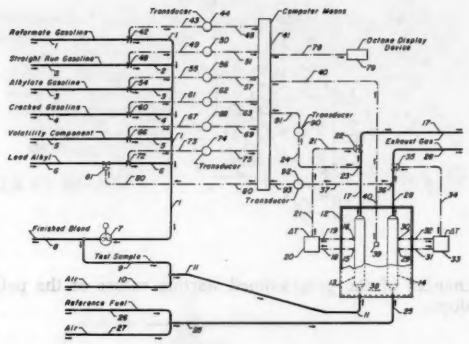

A burner-cooler combination performing the functions of burner, flame arrester and cooler is provided in a single compact device. Both the burner and the cooler-condenser elements are of sintered metal construction and are cylindrical in configuration. In the construction described both the burner cylinder and the cooler-condenser are right circular cylinders and the cooler-condenser encircles and is spaced from the burner. Both components are enclosed in a single housing providing both for containment and dispensing of the cold product gas and for collection and removal of condensate. Ignition means are disposed in communication with the space between the burner and the cooler-condenser.

**3,672,840**

## DETERMINATION AND CONTROL OF A COMPOSITION CHARACTERISTIC WHILE BLENDING A MULTI-COMPONENT COMBUSTIBLE FLUID

Ellsworth R. Fenske, Palatine, and Robert W. Sampson, Arlington Heights, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed May 15, 1970, Ser. No. 37,614
Int. Cl. F23n 5/00; G01n 25/46, 33/32
U.S. Cl. 23—230 PC 19 Claims




A blending process wherein a plurality of component fluids is continuously introduced into a blending zone producing a combustible fluid mixture, a method and apparatus for continuously determining and controlling a composition characteristic of the combustible fluid mixture, such as the octane rating of a gasoline blend. A sample of the fluid mixture and a sample of a reference fuel are simultaneously oxidized in an analyzer comprising a stabilized cool flame generator with a servo-positioned flame front, each fuel being burned in an individual combustion chamber. The position of each flame front is automatically detected and utilized to manipulate a combustion parameter in the associated combustion chamber in a manner sufficient to immobilize the flame front generated therein. Means is provided for sensing the manipulated combustion parameter of each combustion chamber, and developing therefrom a condition output signal which is functionally representative of and correlatable with composition characteristic for the fluid mixture sample. Means is also provided for adjusting the condition output signal responsive to analyzer temperature fluctuations and component changes in the blending zone. Thus, the condition output signal is compensated for combustion effects not indicative of composition characteristic, and is thereby rendered functionally representative of and correlatable with the true composition characteristic of the fluid sample of blended product.

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**3,672,841**

## ANALYSIS OF ORGANIC AND INORGANIC WATER POLLUTANTS

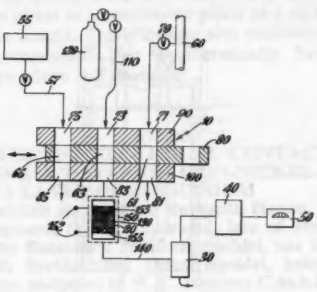
Donald C. Freeman, Jr., Katonah, N.Y., and Louis J. Rogers, Stamford, Conn., assignors to Ionics Incorporated

Filed Dec. 14, 1970, Ser. No. 97,707
Int. Cl. G01n 33/18, 31/12; B01j 11/02
U.S. Cl. 23—230 PC 3 Claims

A method is provided for replenishing the catalyst component of an analyzer adapted to measure the total inorganic carbon content of a fluid sample.

The need for water analysis has become increasingly important with expanding interest in the abatement of

water pollution, and for determining leaks in vessels such as heat exchangers used in industry. One set of parameters



of great utility has been the concentrations of carbon; organic, inorganic and total.

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**3,672,842**
**WRITING INSTRUMENT AND INDICATOR METHOD**
**Walter Florin, 36 Wood Lane, Woodmere, N.Y. 11598**
**No Drawing. Filed June 2, 1969, Ser. No. 829,810**
**Int. Cl. G01n** *21/08, 21/20;* **C09d** *11/12*
**U.S. Cl. 23—230 R** **12 Claims**

A marking tool for detecting the presence of suspected chemical substances on or adjacent to or even constituting a surface by dispensing therefrom upon the said surface a reagent, in solid or liquid form, which is capable of undergoing colorimetric change upon reaction with the chemical substances, the reaction being permitted to occur in a film environment at the situs of the mark. Crayons, pencils, nibbed pens, ball point pens and other stylus-like containers or writing instruments are considered within the scope of this invention. The reagents may be any detecting dye or other chemical substance which is susceptible of a color change during the described reaction, thereby indicating the presence of the chemical substance.

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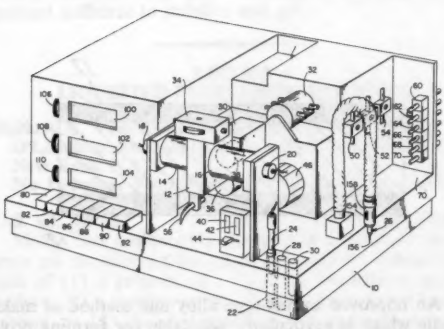
**3,672,843**
**FLUID ANALYZING APPARATUS**
**Thomas A. Rosse, Lexington, and David E. Blackmer, Harvard, Mass., assignors to Instrumentation Laboratory, Inc., Lexington, Mass.**
**Filed Apr. 7, 1970, Ser. No. 27,195**
**Int. Cl. G01n** *27/00, 31/00, 33/16*
**U.S. Cl. 23—253 R** **10 Claims**



Fluid sample analyzing apparatus includes a sample chamber, a constituent sensor in communication with the sample chamber, a first control for controlling the flow of fluid to the sample chamber and a second control for controlling the removal of fluid from the sample chamber. A sequencer operates the first and second controls to selectively channel cleaning fluid, calibrating fluid and sample fluid for sensing by the sensor to the sample chamber. A gaseous constituent of the sample is sensed by an electrode having a selectively permeable membrane.

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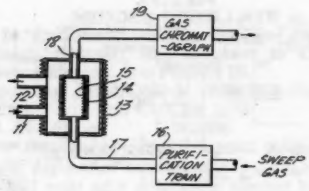
**3,672,844**
**CARBON CONTENT ANALYSIS**
**Geoffrey Long, Abingdon, England, assignor to United Kingdom Atomic Energy Authority, London, England**
**Filed June 9, 1970, Ser. No. 44,726**
**Claims priority, application Great Britain, June 13, 1969, 30,212/69**
**Int. Cl. G01n** *7/10, 7/12, 7/00*
**U.S. Cl. 23—253 R** **9 Claims**




An enclosure of a metal in which carbon is soluble and mobile at the relevant operating temperature is inserted into the fluid to be analysed for carbon content. On the interior surface of the enclosure is a layer of solid decarburant. Carbon permeating through the walls of the enclosure reacts with the decarburant to produce a gas. Measurement of this gas production provides an indication of carbon content of the fluid.

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**3,672,845**
**TEST DEVICE FOR ALBUMIN**
**Bruno J. Verbeck, Lombard, Ill., assignor to Miles Laboratories, Inc., Elkhart, Ind.**
**Continuation of application Ser. No. 703,002, Feb. 5, 1968. This application July 28, 1970, Ser. No. 64,090**
**Int. Cl. G01n** *31/22, 33/16*
**U.S. Cl. 23—253 TP** **10 Claims**

A testing device for the detection of albumin in urine in the form of a carrier, such as a plastic sheet material, which has had applied thereover a layer of particulate hydrophilic absorptive material, a portion of which has been first impregnated with a solution of an indicator which exhibits protein error and then dried, and a second portion of particulate material which has been impregnated with a solution of a buffer compound for maintaining the urine with which the device is to come in contact at a pH which is within or below the range through which the indicator changes color due to a change in pH. The device may also comprise a carrier which has had applied thereon a layer composed of agglomerates of particulate hydrophilic absorptive material, such as aluminum oxide, silica gel, cellulose, exfoliated vermiculite or the like, which agglomerates have been formed by first compressing into a compacted form a mixture of the said particulate material which has been prepared by first impregnating one portion of it with a solution of indicator which exhibits protein error and then dried, and a second portion with a solution of a

buffer and thereafter particulating the compacted form so as to form agglomerates composed of the two kinds of discrete particles of the hydrophilic absorptive material and the indicator and buffer with which said particles have been impregnated.

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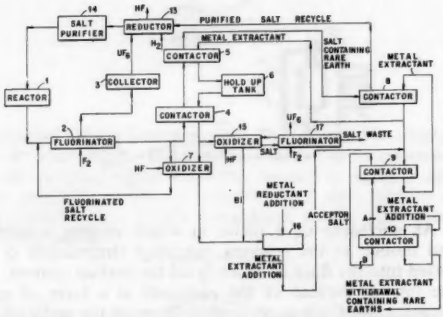
**3,672,846**

## METHOD FOR REPROCESSING SPENT MOLTEN SALT REACTOR FUELS

**Leonard E. McNeese, Oak Ridge, and Don E. Ferguson, Knoxville, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission**

**Filed Apr. 21, 1970, Ser. No. 30,423**
**Int. Cl. C22b *61/04***
**U.S. Cl. 23—325** **7 Claims**




A method for reprocessing spent molten metallic fluoride salt mixtures suitable as molten salt breeder reactor fuels is provided wherein uranium, protactinium and certain rare earths are removed from the spent salt mixture prior to recycle of the purified salt mixture back to the reactor. A major fraction of the uranium contained in the spent salt mixture is removed by fluorination with the uranium hexafluoride being reconstituted into the purified salt for return to the reactor. The remaining uranium and protactinium are removed in a protactinium isolation unit by reductive extraction into a molten bismuth solution containing lithium, thorium, and $^{233}Pa$ as metal reductants. The extracted uranium is carried out of the unit by the metal solution while the protactinium is held-up within the unit in the bismuth phase. The rare earths are then reductively extracted from the uranium and protactinium-free spent salt mixture in a rare earth removal unit into a molten bismuth solution containing lithium and thorium as metal reductants. The rare earths are then back extracted from the bismuth phase into an acceptor salt selected from lithium chloride, lithium bromide and mixtures thereof. Hydrogen fluoride oxidizers are provided for removal of extracted materials, including fission products which form non-volatile fluorides during fluorination, metal corrosion products, and $^{231}PaF_4$, from the bismuth in order to regenerate the bismuth solution. Provision is also made for the separate recovery from the acceptor salt of divalent and trivalent rare earths.

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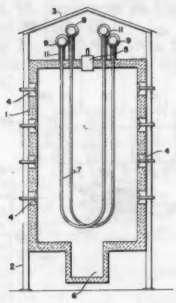
**3,672,847**

## REFORMER FURNACE

**Abraham J. Esselink, Essenlaan, Netherlands, assignor to Selas Corporation of America**

**Filed Mar. 5, 1970, Ser. No. 16,649**
**Int. Cl. B01j *9/00***
**U.S. Cl. 23—288 M** **2 Claims**

This invention relates to a hydrocarbon steam reforming furnace in which the reforming tubes are coated on their inner surfaces with a catalyst. This permits the use of tubes that are smaller in diameter and longer than



usual, and permits the tubes in this type of furnace to be bent into coils.

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**3,672,848**

## PROCESSING OF IRRADIATED NUCLEAR FUELS

**Alfred Leonard Mills and Robert William Jackson Vivers, Thurso, Scotland, assignors to United Kingdom Atomic Energy Authority, London, England**

**No Drawing. Filed Dec. 31, 1969, Ser. No. 889,728**
**Int. Cl. C01g *43/00, 57/00***
**U.S. Cl. 23—342** **1 Claim**

A method in which irradiated monocarbide nuclear fuel is dissolved in nitric acid and the solution is subjected to the oxidising effect of ozone or electrolytic oxidation to effect oxidation of organic compounds in the solution. Oxidation is terminated at the onset of the conversion of plutonium in the solution to the hexavalent state.

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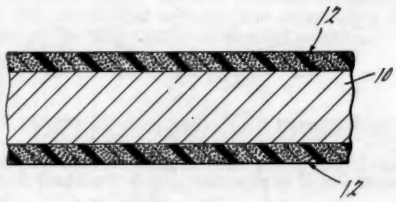
**3,672,849**

## CERMET-TYPE ALLOY COATING ON METAL BASE

**Nikolajs Bredzs, Detroit, and Forbes M. Miller, Dearborn, Mich., assignors to Wall Colmonoy Corporation**

**Application Feb. 19, 1969, Ser. No. 800,540, now Patent No. 3,547,673, dated Dec. 15, 1970, which is a continuation-in-part of application Ser. No. 646,654, June 16, 1967. Divided and this application July 7, 1969, Ser. No. 871,121**
**The portion of the term of the patent subsequent to Dec. 15, 1987, has been disclaimed**
**Int. Cl. B32b *15/00***
**U.S. Cl. 29—195** **3 Claims**




An improved cermet-type alloy and method of making same which is particularly adaptable for forming protective surface coatings on heat-resistant alloys. A particulated mixture is formed containing titanium and/or zirconium reactive metal constituents that undergo an exothermic reaction upon fusion at an elevated temperature

in a substantially inert atmosphere with silicon and/or boron present in the mixture forming the corresponding silicides or borides of the reacted metals in situ which are subsequently precipitated as a uniformly dispersed discontinuous phase in a continuous phase of a nickel and/or cobalt base matrix. The invention also encompasses novel powder compositions for exothermically forming the cermet-type alloys and coatings.

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**3,672,850**
**LOW CURRENT ELECTRICAL CONTACT COMPRISING A LAYER OF IRON-NICKEL ALLOY AND A LAYER OF RUTHENIUM**

**Walter Reichelt and Konrad Ruthardt, Hanau, Germany, and Hermann Speidel, deceased, late of Hanau, Germany, by Rosemarie Elisabeth Speidel, nee Rupprecht, Helmuth Speidel, and Dieter Speidel, heirs, Hanau, Germany, assignors to W. C. Heraeus G.m.b.H., Hanau (Main), Germany**

**Filed Apr. 13, 1970, Ser. No. 27,779**
**Claims priority, application Germany, May 6, 1969, P 19 23 010.5**
**Int. Cl. B32b *15/00***
**U.S. Cl. 29—196** **2 Claims**

Ruthenium (Ru) is vapor deposited directly on a springy magnetic contact carrier of iron-nickel alloy, at pressures of less than $10^{-1}$, and preferably less than $10^{-4}$, mm. Hg to form adjacent crystal columns extending in a direction essentially perpendicular to the surface of the contact carrier facing the ruthenium contact layer.

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**3,672,851**
**GELLED ALCOHOL FUEL CONTAINING NITROCELLULOSE AND BORIC ACID**

**Joseph M. Ihm, 1481 W. 64th Ave., Vancouver 14, British Columbia, Canada**

**No Drawing. Continuation-in-part of application Ser. No. 741,219, June 28, 1968. This application Apr. 26, 1971, Ser. No. 137,658**
**Int. Cl. C10l *7/04***
**U.S. Cl. 44—7 B** **4 Claims**

A solid alcohol fuel gel having improved storage and burning properties comprising an alcoholic fuel gel which is a gelled solution of high viscosity nitrocellulose in methyl alcohol, said gel containing boric acid in an amount sufficient to stabilize said gel.

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**3,672,852**
**LIQUEFIED PETROLEUM GAS FUEL COMPOSITION**

**Herbert E. Vermillion, Wappingers Falls, and James J. O'Loughlin, Tuckahoe, N.Y., assignors to Texaco Inc., New York, N.Y.**

**No Drawing. Filed Mar. 27, 1970, Ser. No. 23,500**
**Int. Cl. C10l *1/06***
**U.S. Cl. 44—52** **21 Claims**

Motor fuel composition comprising a liquefied petroleum gas containing from about 0.0001 to 0.1 volume percent of (1) a polymer of a $C_2$ to $C_6$ unsaturated hydrocarbon, (2) a copolymer of a $C_2$ to $C_6$ unsaturated hydrocarbon, or (3) the corresponding hydrogenated polymer or copolymer, said polymer or copolymer having a molecular weight in the range from about 500 to 3500 and a method for operating an internal combustion gasoline engine.

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**3,672,853**
**PREPARATION OF A LIQUID FUEL FOR A PRESSURE-TYPE ATOMIZER**

**Gerrit H. Reman and Henri Verkoren, Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.**

**No Drawing. Filed Apr. 21, 1969, Ser. No. 818,074**
**Claims priority, application Netherlands, Apr. 22, 1968, 6818913**
**Int. Cl. C10l *1/00***
**U.S. Cl. 44—52** **5 Claims**

Decreasing the viscosity of and improving the atomizing and burning characteristics of a heavy hydrocarbon by dissolving a non-hydrocarbon gas in the heavy hydrocarbon in an amount not exceeding 95% of saturation at conditions of temperature and pressure immediately preceding atomization.

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**3,672,854**
**MIDDLE DISTILLATE**

**Robert H. Rosenwald, Western Springs, and Alexander Gaydasch, Chicago, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.**

**No Drawing. Filed Dec. 3, 1969, Ser. No. 881,895**
**Int. Cl. C10l *1/18***
**U.S. Cl. 44—66** **3 Claims**

Middle distillate of improved pour point containing a pour point depressant amount of a $C_{14}$–$C_{26}$ saturated carboxylic acid ester of a polyhydric alcohol having from 4 to 8 hydroxy groups.

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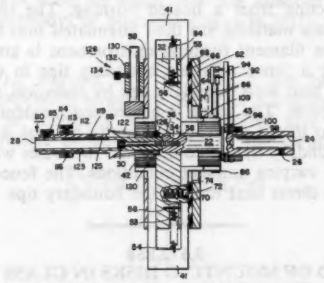
**3,672,855**
**GLASS LENS EDGING APPARATUS**

**Charles R. Bright, 8423 E. Hubbell, Scottsdale, Ariz. 85257**

**Filed Nov. 30, 1970, Ser. No. 93,521**
**Int. Cl. B24b *9/08***
**U.S. Cl. 51—101 LG** **11 Claims**



A glass lens edging apparatus which senses the inside periphery of the lens holding frame at a plurality of points and uses these sensor points for controlling lens forming equipment.

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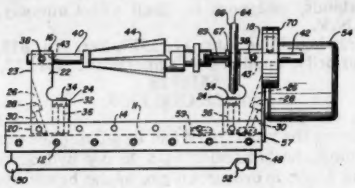
**3,672,856**
**CENTERING FIXTURE**

**Nathan Rubenstein, 1506 Birchwood Ave., Chicago, Ill. 60626**

**Filed Sept. 14, 1970, Ser. No. 72,053**
**Int. Cl. B24b *41/06***
**U.S. Cl. 51—237** **9 Claims**

A fixture having reversible posts and repositionable centers for holding workpieces for processing by a surface grinder, such as outside diameter grinding. The fixture is also used for treating a workpiece such as dressing radii on a grinding wheel forming a true reduced thickness

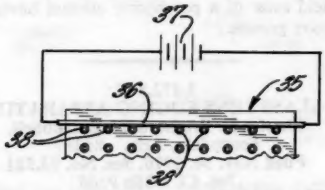
width on a grinding wheel, or using a form to crush a wheel. The fixture permits versatile use, and it is dimensioned so that it may be readily adaptable to be held by a magnetic chuck placed on a surface grinder.



## 3,672,857
## APPARATUS FOR PRODUCING GLASS FILAMENTS WITH AUXILIARY HEATING MEANS

Charles J. Stalego, Newark, Ohio, assignor to Owens-Corning Fiberglass Corporation

Filed Apr. 27, 1970, Ser. No. 31,904
Int. Cl. C03b *37/00*
U.S. Cl. 65—12 14 Claims

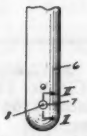


Apparatus for producing glass filaments wherein streams of molten glass material flow through an array of orificed tips projecting from a heated bushing. The streams of molten glass material are then attenuated into filaments. A uniform filament forming environment is attained by employing a fence adjacent boundary tips in the array of tips to heat such boundary tips by radiation, reflection or conduction. The fence is heated independently of the bushing so that a controlled quantity of heat is supplied to the boundary tips to compensate for losses which may vary with varying ambient conditions. The fence may be shaped to direct heat toward the boundary tips.

## 3,672,858
## METHOD OF MOUNTING DISKS IN GLASS WALLS, HEAT WORKING ONLY ONCE

Robert H. Berg, 196 Clinton Ave., Elmhurst, Ill. 60126

Filed Apr. 17, 1970, Ser. No. 29,390
Int. Cl. C03c *27/00*
U.S. Cl. 65—43 5 Claims

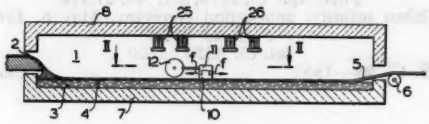


In mounting a disk in a glass wall, the glass wall is heat worked in a small area and a hole made through said heat worked area of the wall with, for example, a hot wire. The heat worked glass around the hole is removed, and the hole is enlarged without heat working to make the hole aperture size and tapered. The aperture is made large enough at one end to receive the disk and small enough at the other end so that the disc will not pass through the hole. The disk is mounted in the aperture and locked into place by heat working beads of glass around the perimeter of the disk.

## 3,672,859
## METHOD FOR THE PRODUCTION OF A FLOAT GLASS STRIP HAVING A ROUGHENED UPPER SURFACE

Franz Classen, Porz-Grengel, Germany, assignor to Erste Deutsche Floatglas GmbH & Co. OHG, Porz, Cologne, Germany

Filed Dec. 16, 1969, Ser. No. 885,500
Claims priority, application Germany, Jan. 25, 1969, P 19 03 756.0
Int. Cl. C03b *13/04*
U.S. Cl. 65—93 6 Claims

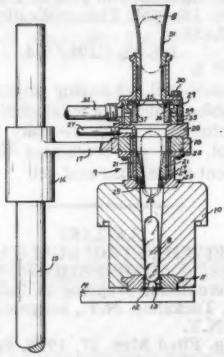


Glass floating on tin in a float glass plant is superficially roughened by a tool. This method is accomplished by producing a temperature gradient through the glass so that the upper surface has a higher temperature than the glass further down. The upper surface of the glass is roughened by a non-adhesive frictional tool and the glass is heat treated to preserve the upper surface of the glass.

## 3,672,860
## GLASS GOB SHAPING AND DELIVERING MEANS

Robert H. Keller, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Continuation of application Ser. No. 743,373, July 9, 1968. This application Aug. 19, 1970, Ser. No. 65,239
Int. Cl. C03b *5/30, 39/00*
U.S. Cl. 65—208 4 Claims



In the forming of narrow neck parisons by the process termed "blow and blow," the mold charges in the form of substantially cylindrical gobs are delivered to a gob centering guide positioned in alignment with the cavity of the parison mold. When the parison mold is of non-cylindrical cross-section, such as used in the formation of parisons which are to be expanded into flask-shaped containers having relatively flat sides, it is advantageous that the glass distribution in the parison be closely controlled. In order to form a better and more uniform

parison, the present invention provides a shaping funnel portion positioned between the gob centering guide and the parison mold for pre-shaping the gob as it falls through the funnel into a generally oval cross-section, corresponding to the oval cross-section of the body portion of the parison mold cavity.

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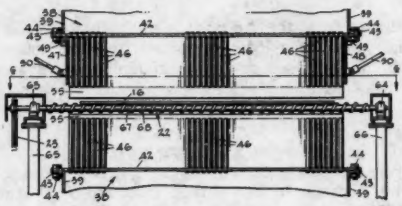
3,672,861

## APPARATUS FOR TEMPERING FLAT SHEETS OR PLATES OF GLASS

George F. Ritter, Jr., Toledo, and Frank J. Hymore, Oregon, Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Nov. 16, 1967, Ser. No. 683,581
Int. Cl. C03b 27/00
U.S. Cl. 65—350 5 Claims



Tempering thin sheets of flat glass, for example ⅛ inch, by conveying heated sheets to be tempered horizontally between a plurality of upper and lower tubular members which direct individual streams of cooling fluid, under relatively high pressure, against opposite surfaces of the sheet to temper the same, the pressure of the cooling fluid directed against the bottom surface of the sheet being relatively greater than that applied to the upper surface, a volume of back-up air being maintained above the sheet to compensate for the higher pressure applied to the bottom of the sheet and the tubular members above and beneath the sheet being separated into a plurality of groups to minimize turbulence of the cooling fluid.

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3,672,862

## RHIZOBITOXINE AS A POST-EMERGENT HERBICIDE

Lowell D. Owens, Greenbelt, Md., assignor to the United States of America as represented by the Secretary of Agriculture

No Drawing. Continuation-in-part of application Ser. No. 757,117, Sept. 3, 1968. This application Dec. 12, 1969, Ser. No. 884,727
Int. Cl. A01n 9/00
U.S. Cl. 71—79 2 Claims

Rhizobitoxine, a phytotoxic compound synthesized by the bacterium *Rhizobium japonicum*, is combined with a specifically formulated solution of surfactant and wetting agent to provide post-emergent herbicidal activity.

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3,672,863

## DRY AMINOTRIAZOLE HERBICIDAL FORMULATION

James Edward Esposito, Ambler, Pa., assignor to Amchem Products, Inc., Lower Gwynedd Township, Montgomery County, Pa.

No Drawing. Filed Mar. 28, 1969, Ser. No. 811,583
Int. Cl. A01n 13/00
U.S. Cl. 71—82 2 Claims

A non-caking, water soluble, powdered herbicidal concentrate containing 3-amino-1,2,4-triazole and ammonium thiocyanate in admixture with a pregelatinized cold water starch and an ultrafine filler.

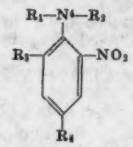
3,672,864

## CONTROL OF PESTS WITH CYCLOALKANE DERIVATIVES OF NITRATED ARYL COMPOUNDS

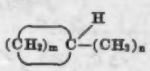
Lester L. Maravetz, Westfield, N.J., assignor to Esso Research and Engineering Company

No Drawing. Continuation-in-part of application Ser. No. 749,326, Aug. 1, 1968. This application June 11, 1970, Ser. No. 45,560
Int. Cl. A01n 9/14
U.S. Cl. 71—103 18 Claims

Compounds characterized by the following formula:



wherein (1) $R_1$ is a cycloalkyl-containing grouping such as



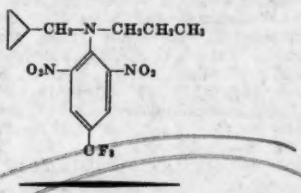
in which the cycloalkyl ring may be substituted with $C_1$–$C_3$ alkyl, $C_2$–$C_3$ alkenyl, halogen; $m$ is a positive integer of 2 to 4 and $n$ is 0 or 1 to 3; (2) $R_2$ is hydrogen; $C_1$–$C_{12}$ straight or branched chain alkyl, $C_2$–$C_6$ alkenyl or $C_2$–$C_6$ alkynyl; $C_3$–$C_8$ cycloalkyl; $C_4$–$C_{10}$ cycloalkylalkyl; $C_2$–$C_{12}$ alkoxyalkyl; $C_1$–$C_{12}$ haloalkyl; $C_1$–$C_{12}$ cyanoalkyl; $C_2$–$C_6$ acyl; $C_2$–$C_6$ alkylmercaptoalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl; (3) $R_3$ is hydrogen, $NO_2$, halogen, $C_1$–$C_6$ alkyl, C≡N; and (4) $R_4$ is hydrogen, $C_1$–$C_{12}$ alkyl, haloalkyl, cycloalkyl, halogen, $CF_3$, $NO_2$, C≡N, phenyl, substituted phenyl,

$$N{=}N{-}C_6H_5$$

$SO_2NR_5R_6$ wherein $R_5$ and $R_6$ can be the same as $R_2$ above; in addition, $R_5$ and $R_6$ when taken together with the nitrogen atom to which they are attached form an aziridyl, pyrolidyl or piperidyl ring; $CH_3S(O)_x$,

$$C_2H_5S(O)_x$$

$C_3H_7S(O)_x$, wherein $x$ is 0, 1 or 2; are biologically active compounds especially useful as herbicides. Exemplary of an especially preferred nitrated aryl cyclopropane derivative is the compound of the formula::



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3,672,865

## INCREASING THE SUGAR CONTENT OF CROPS WITH α-UREIDOOXYCARBOXYLIC ACIDS AND THEIR DERIVATIVES

Linus M. Ellis, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 801,169, Feb. 20, 1969, which is a continuation-in-part of application Ser. No. 657,049, July 31, 1967, which is a continuation-in-part of application Ser. No. 572,888, Aug. 17, 1966, which in turn is a division and continuation-in-part of application Ser. No. 206,154, June 29, 1962, now Patent No. 3,282,987. This application Jan. 5, 1970, Ser. No. 846
Int. Cl. A01n 9/24
U.S. Cl. 71—106 6 Claims

The sugar content of sugar cane and sorghum can be increased by applying to those crops an effective amount

of an α-ureidooxycarboxylic acid compound, such as methyl α-ureidooxypropionate or ethyl ureidooxyacetate, during the period of 10 to 60 days prior to normally scheduled harvest.

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**3,672,866**

**USE OF N-(SEC-BUTYL)-4-(t-BUTYL)-2,6-DINITROANILINE AS A SELECTIVE HERBICIDE**

**John Joseph Damiano, Springfield, Pa., assignor to Amchem Products, Inc., Township of Lower Gwynedd, Montgomery County, Pa.**

**No Drawing. Continuation-in-part of application Ser. No. 878,583, Nov. 20, 1969. This application Nov. 12, 1970, Ser. No. 89,010**

**Int. Cl. A01n *9/20***

**U.S. Cl. 71—121** **1 Claim**

Novel herbicidally active 4-butyl-2,6-dinitroaniline derivatives are prepared by nitration of 4-butylphenol, followed by conversion of the resulting 2,6-dinitrophenol into the chloro-derivative and finally reacting the chloro-derivative with a primary amine.

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**3,672,867**

**SUBMICRON FERROMAGNETIC ALLOY PARTICLES CONTAINING COBALT, BORON, AND ZINC**

**Ernest Lewis Little, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Filed Dec. 7, 1970, Ser. No. 95,836**

**Int. Cl. H01f *1/08, 1/20;* C22c *19/00***

**U.S. Cl. 75—.5 AA** **17 Claims**

Submicron particles, useful in magnetic applications, consisting essentially of cobalt, zinc, and boron in 70–92 to 1–8 to 1–5.6 weight ratio and up to 22 percent by weight water and oxygen, are prepared by reducing $Co^{2+}$ in solutions containing $Zn^{2+}$ by means of selected borohydrides and preferably heat-treating the products in hydrogen. After heat treatment substantial quantities of hexagonal close-packed cobalt may be detected by X-ray diffraction. The particles are useful in a variety of magnetic applications, e.g., in magnetic recording tapes, in bar magnets and the like.

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**3,672,868**

**ZINC DUST FOR REMOVAL OF COBALT FROM ELECTROLYTE**

**Tokushige Hasegawa, Narashino, Kuninobu Makimoto, Aizu-Wakamatsu, and Seiji Nihei and Jiro Takahira, Bandai-machi, Yama-gun, Japan, assignors to Nisso Kinzoku Kabushiki Kaisha, Tokyo-to, Japan**

**Original application Apr. 9, 1968, Ser. No. 719,951, now Patent No. 3,579,327, dated May 18, 1971. Divided and this application Aug. 6, 1970, Ser. No. 61,859**

**Int. Cl. C22c *17/00;* C22f *19/26, 23/04***

**U.S. Cl. 75—.5 A** **1 Claim**

Zinc dust containing a small amount of antimony or antimony and lead as alloy elements is added into an electrolyte used in hydrometallurgy of zinc, in order to remove cobalt impurities from the electrolyte of zinc sulfate solution.

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**3,672,869**

**CONTINUOUS METALLURGICAL PROCESS**

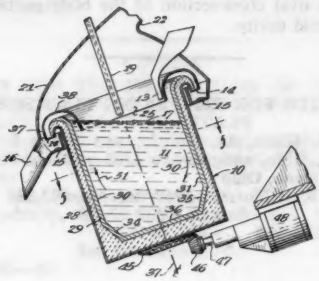
**Conrad F. Niehaus, 2 Muirfield Road, Emmarentia, Johannesburg, Transvaal, Republic of South Africa**

**Filed Apr. 13, 1970, Ser. No. 27,695**

**Int. Cl. C21c *1/00, 7/00***

**U.S. Cl. 75—45** **18 Claims**

Relatively unrefined or untreated molten metal and one or more treating or refining ingredients (e.g., oxygen, flux, alloying addition) are continuously introduced onto the top of a bath of relatively refined or treated molten metal contained in a predominantly vertically tilted vessel, rotated about its longitudinal axis. Surface and sub-surface bath currents, resulting from rotation of the tilted vessel, enhance and speed up the refining or treating action. Relatively refined or treated molten metal is continuously



withdrawn from the top portion of the bath, at the front of the vessel, at a location spaced from the location at which the unrefined or untreated molten metal is introduced.

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**3,672,870**

**SPRAY REFINING**

**Malvern John Rhydderch, Firbeck, near Worksop, England, assignor to The British Iron and Steel Research Association**

**Original application May 22, 1967, Ser. No. 640,122, now Patent No. 3,554,521. Divided and this application Mar. 27, 1970, Ser. No. 29,724**

**Claims priority, application Great Britain, May 23, 1966, 22,790/66**

**Int. Cl. C21c *5/00***

**U.S. Cl. 75—52** **4 Claims**

A method and apparatus for refining iron in which a stream of molten iron is shattered by oxidising gas in a vessel from which gas is withdrawn to induce air into the vessel.

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**3,672,871**

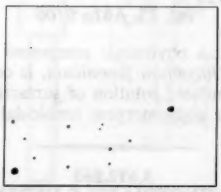
**METALLURGICAL MATERIAL AND PROCESSES FOR TREATING STEEL THEREWITH**

**William A. Brown, Rector, and John F. Drenning, Monroeville, Pa., assignors to Miller and Company, Chicago, Ill.**

**Continuation-in-part of application Ser. No. 645,557, May 11, 1967, which is a substitute for application Ser. No. 172,614, Feb. 12, 1962. This application Jan. 12, 1970, Ser. No. 2,202**

**Int. Cl. C21c *7/04***

**U.S. Cl. 75—58** **2 Claims**



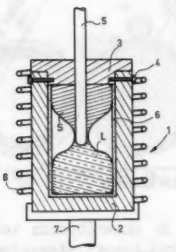
Coarse (—⅜ inch) metallurgical-grade silicon carbide has 6–15 weight percent of sodium carbonate added to it, and this is used as a treatment agent for recarburizing, resiliconizing, or deoxidizing steel and insuring its cleanliness. This makes it possible to use a coarser material, while improving the quality of the steel and the efficiency of the utilization of the silicon contained in the silicon carbide. Compared with deoxidizing with ferrosilicon of 50% silicon content or with aluminum, cost savings are also effected.

3,672,872

## METHOD OF SEPARATION OF A SUBSTANCE IN A SOLID OR LIQUID PHASE FROM A MATRIX IN THE LIQUID PHASE

Etienne Bonnier, Colette Allibert, Jean Driole, and Alain Wicker, Grenoble, France, assignors to Agence Nationale de Valorisation de la Recherche, Puteaux, France

Filed June 1, 1970, Ser. No. 42,307
Int. Cl. B23d 1/00; C22b 7/00; C22c 1/00
U.S. Cl. 75—63 11 Claims



A method of separation of a substance in a solid or liquid phase from a matrix in the liquid phase, at high temperature, by the creation of an alternating magnetic field of medium frequency in the composite mixture formed by said substance and said matrix, followed by a solidification tempering action. A device for carrying the method into effect comprises a crucible, heating means for the crucible, an inductor winding around the said crucible, and further comprises a medium-frequency alternating-current generator, of 10 kilocycles for example, associated with the winding. The inductor winding on the crucible may serve simultaneously as the heating means for the crucible and the electro-magnetic separating means, or the heating may be independent of the electro-magnetic means and may be constituted by an electrical resistance.

3,672,873

## SEPARATION OF NICKEL FROM COBALT

David Anthony Huggins, Mississauga, Ontario, Canada, and Walter Curlook, Neuilly, France, assignors to The International Nickel Company, Inc., New York, N.Y.

No Drawing. Filed Mar. 11, 1970, Ser. No. 18,721
Claims priority, application Canada, Mar. 28, 1969, 047,217
Int. Cl. C22b 23/04
U.S. Cl. 75—101 R 29 Claims

Directed to a process for separately recovering nickel and cobalt from an aqueous solution containing the same wherein the nickel and cobalt contents are precipitated as reducible compounds, e.g., basic carbonates, separating and drying the resulting precipitates, reducing the compounds at a temperature below about 400° C. and then treating the reduced metal products with carbon monoxide at superatmospheric pressures and a temperature below 100° C. to evolve nickel carbonyl thereby separating the nickel from the cobalt in the reduced product.

3,672,874

## RECOVERY OF RHENIUM VALUES FROM A SPENT CATALYST

Charles L. Wiley, Blanchard, La., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Nov. 12, 1970, Ser. No. 88,993
Int. Cl. C01g 49/00
U.S. Cl. 75—101 R 8 Claims

Rhenium values are recovered from a spent rhenium-platinum-alumina catalyst. The catalyst is treated with sulfuric acid to form a rhenium-containing aluminum sulfate solution and a platinum-containing residue. The rhenium-containing solution is passed in contact with the sulfate ionic form of an anionic exchange resin whereby rhenium is absorbed thereon. The rhenium is subsequently eluted from the resin.

3,672,875

## EXTRACTION OF FISSION PRODUCT NOBLE METALS FROM SPENT NUCLEAR FUELS

Adolfo MacCragh, Ellicott City, Md., assignor to W. R. Grace & Co., New York, N.Y.

No Drawing. Filed Sept. 5, 1969, Ser. No. 855,775
Int. Cl. C22b 11/06
U.S. Cl. 75—112 13 Claims

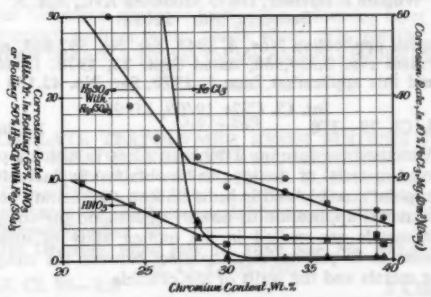
A process for separating the fission product metals from spent nuclear fuels, in which the insolubles from the fuel element dissolution are heated in a stream of halide gas to convert the residues to the halides. The ruthenium and rhodium fractions are converted to the complex haloruthenite and halorhodite, followed by dissolution and distillation to remove ruthenium. The rhodium is recovered by neutralizing the undistilled portion and reducing to the metal. Palladium and technetium are recovered from the halides volatilized in the first step of the process.

3,672,876

## DUCTILE CORROSION-RESISTANT FERROUS ALLOYS CONTAINING CHROMIUM

Donald J. Sipos, Newark, Del., Robert F. Steigerwald, McKeesport, Pa., and Newell E. Whitcomb, Newark, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 707,350, Jan. 26, 1968, which is a continuation-in-part of application Ser. No. 623,402, Mar. 15, 1967. This application May 4, 1970, Ser. No. 34,166
Int. Cl. C22c 37/10, 39/14
U.S. Cl. 75—124 3 Claims




An iron, 28%–37% chromium content alloy in which postwelding ductility is improved by the incorporation of small amounts in the approximate range of about 0.1% to 1.0% of Al, Cu, Pt, Pd or Ag, or combinations of Al+Cu, Al+Ag, Al+V or Al+Cu+V.

3,672,877

## CORROSION-RESISTANT RAZOR BLADES

Jan-Christer Henric Ovesson Carlen and Claes Bertil Bergqvist, Sandviken, Sweden, assignors to Sandviken Gernverks Aktiebolag, Sandviken, Sweden

Continuation of application Ser. No. 665,320, Sept. 5, 1967. This application July 27, 1970, Ser. No. 64,087
Claims priority, application Sweden, Sept. 22, 1966, 12,737/66
Int. Cl. C22c 39/14, 39/48
U.S. Cl. 75—126 C 3 Claims

Steels suitable for making corrosion-resistant razor blades contain chromium and carbon, and may contain

silicon, manganese, molybdenum, tungsten, copper, cobalt, nickel, niobium, tantalum, titanium, vanadium, zirconium, boron or beryllium. The ratio of chromium to carbon is less than 30:1; the carbon content is 0.3–0.5 wt. percent; the silicon content is within the range 0.8–2.0 wt. percent, and the chromium content is 9.0–10.8 wt. percent. A tool formed from a steel of this class has a hardness exceeding VPN 800 in the hardened condition, and a hardness after tempering up to 45–0° C. within the range VPN 720–850.

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**3,672,878**

## ALUMINUM OFFSET PRINTING PLATE

**Adolf Teubler, Uedorf, near Bonn, and Paul Eversheim, Bonn, Germany, assignors to Vereinigte Leichtmetall-Werke G.m.b.H., Bonn, Germany**

**No Drawing. Filed Sept. 24, 1969, Ser. No. 860,805**

**Claims priority, application Germany, Sept. 27, 1968, P 17 83 066.9; June 9, 1969, P 19 29 146.4**

**Int. Cl. C22c *21/04***

**U.S. Cl. 75—141** **4 Claims**

An aluminum printing plate for use in offset roller plating is made of an aluminum base alloy including the following alloying components:

| | Percent |
|---|---|
| Magnesium | 0.8–2.5 |
| Silicon | 0.2–0.4 |
| Manganese | 0.8–1.4 |
| Copper | 0.05–0.3 |
| Iron | 0.2–0.6 |
| Zinc | 0.01–0.2 |
| Aluminum | Balance |

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**3,672,879**

## TiNi CAST PRODUCT

**William J. Buehler, 10613 Montrose Ave., Apt. 3, Bethesda, Md. 20014**

**Original application Nov. 4, 1966, Ser. No. 592,069, now Patent No. 3,529,958, dated Sept. 22, 1970. Divided and this application June 1, 1970, Ser. No. 42,133**

**Int. Cl. C22c *19/00, 15/00***

**U.S. Cl. 75—170** **1 Claim**

A method for forming TiNi base alloys in which a prealloyed material of the type to be obtained is placed into a graphite crucible and is heated above the melting point by external application of power, whereupon the component metals are melted in the molten alloy in such a manner as to prevent direct contact between the component metals and the walls of the crucible.

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**3,672,880**

## PLATINUM-RHODIUM-GOLD ALLOYS

**Alan Sydney Darling and Gordon Leslie Selman, London, England, assignors to Johnson, Matthew & Co., Limited, London, England**

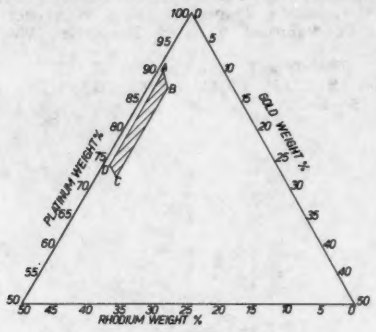
**Continuation-in-part of application Ser. No. 750,641, Aug. 6, 1968, which is a continuation of application Ser. No. 558,398, June 17, 1966. This application Feb. 20, 1970, Ser. No. 12,919**

**Claims priority, application Great Britain, June 19, 1965, 26,028/65**

**Int. Cl. C22c *5/00***

**U.S. Cl. 75—172** **2 Claims**

A method for melting glass which includes introducing glass into a container formed of an alloy consisting of 72–90% by weight of platinum, 9–25% by weight of rhodium and 1–3% by weight of gold. Thereafter, the glass in the container is subjected to a glass melting temperature. Further molten glass can be dispensed by expelling the same through the orifice of a member made of the alloy defined above.

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**3,672,881**

## METHOD OF MAKING POWDER COMPOSITES

**John J. Sowko, Sr., Bethel Park, Pa., assignor to Carmet Company, Pittsburgh, Pa.**

**No Drawing. Filed Nov. 3, 1969, Ser. No. 873,698**

**Int. Cl. B22f *7/06***

**U.S. Cl. 75—208 R** **10 Claims**

Described herein is a method of making a composite article of powdered metal and a refractory hard metal component which involves forming a green compact of powder metal and sintering the compact in contact with the refractory hard metal component to metallurgically bond the two.

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**3,672,882**

## SLIP CASTING

**Joseph R. Sagmuller and Richard I. Hunter, Columbus, Ohio, assignors to The Battelle Development Corporation, Columbus, Ohio**

**Filed May 26, 1969, Ser. No. 827,846**

**Int. Cl. B22f *1/00***

**U.S. Cl. 75—211** **10 Claims**

Fine metal compound powders capable of being reduced to the metallic state are made into a casting slip, cast into a slip casting mold to form a slip cast object which is removed from the mold, reduced and sintered into a pore-free high density object.

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**3,672,883**

## CRYSTALLINE POLYMERS FOR FROST

**Roger N. Ciccarelli and Burton B. Jacknow, Rochester, N.Y., assignors to Xerox Corporation, Rochester, N.Y.**

**No Drawing. Filed July 2, 1969, Ser. No. 838,672**

**Int. Cl. B41n *5/20*; G03g *13/22***

**U.S. Cl. 96—1.1** **18 Claims**

A new class of materials useful in surface deformation imaging is provided comprising the utilization of sharp melting crystalline polymers.

3,672,884

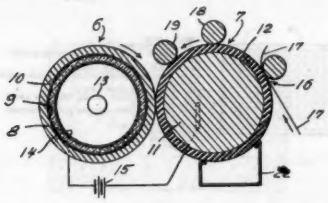
## ELECTROSTATIC PRINTING AND DEVELOPING

Edward F. Mayer, Cleveland, Ohio, assignor to Xerox Corporation, Rochester, N.Y.

Continuation of application Ser. No. 571,644, Aug. 10, 1966, which is a continuation of application Ser. No. 380,285, Sept. 15, 1953. This application Oct. 14, 1968, Ser. No. 770,887

Int. Cl. C03g *13/10, 13/22*

U.S. Cl. 96—1 LY 13 Claims




In the particular embodiments of the invention described herein, electrostatic charge images are formed on the adjacent engaging surfaces of a photoconductive insulating layer and another insulating layer by optical exposure through the photoconductive insulating layer. In one embodiment the layers are disposed on the outside surfaces of first and second rotating drums, respectively, and a light source within one drum projects the image of an original disposed on the inner surface of the drum to the photoconductive insulating layer disposed on the outer surface thereof. Electrostatic charge images are produced on the drum surfaces as a result of a potential difference applied across them and the charge images are moved by drum rotation to a development zone wherein the images are rendered visible by liquid or powdered developer. In another embodiment the electrostatic charge image is transferred from the insulating drum to a further insulating drum upon which it is moved through a development zone.

3,672,885

## FERROCYANIDE-CHELATE CONVERSION SOLUTION FOR ELECTROPHOTOGRAPHIC OFFSET MASTERS

George M. Ort, Chicago, Ill., assignor to A. B. Dick Company, Niles, Ill.

No Drawing. Continuation of application Ser. No. 652,689, July 12, 1967. This application Oct. 23, 1970, Ser. No. 83,629

Int. Cl. G03g *13/00*

U.S. Cl. 96—1 9 Claims

A conversion solution for zinc oxide coated electrophotographic planographic masters in which the conversion solution depends upon the presence of ferrocyanide in solution therein, in which the improvement comprises the formulation of the conversion solution with a chelating agent that sequesters the $Fe^{++}$ and $Fe^{+++}$ ions present in the solution by reason of the equilibrium reaction of the ferrocyanide whereby the solution is stabilized to minimize deterioration and increase the stability and shelf life thereof.

3,672,886

## NOVOLAK RESINS IN DEFORMATION IMAGING

Joseph Mammino, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 421,613, Dec. 28, 1964. This application Dec. 26, 1968, Ser. No. 787,260

Int. Cl. G03g *13/22*

U.S. Cl. 96—1.1 5 Claims

It has been determined that upon the addition an aromatic compound, preferably an aryl amine compound to a phenol-aldehyde type resin that it is now possible to form excellent surface deformation images of enhanced quality on the surface of the latter materials. Thus, upon the addition of the specified additive to a phenol-aldehyde type resin the frost characteristics thereof are substantially enhanced.

3,672,887

## ELECTROPHOTOGRAPHIC PROCESS FOR MULTICOLOR REPRODUCTION

Seiji Matsumoto, Yasuo Tamai, Masaaki Takimoto, and Masamichi Sato, Asaka, Japan, assignors to Xerox Corportion, Rochester, N.Y.

Filed Aug. 17, 1970, Ser. No. 63,818

Int. Cl. G03g *13/22*

U.S. Cl. 96—1.2 9 Claims

Reproduction of a multicolor original in an electrophotographic development employing superimposed development of multiple electrostatic latent images present on an electrophotographic photosensitive layer which is provided with low photoconductivity for a certain wavelength region, and has increased photoconductivity in at least a part of the remaining wavelength region. At least one development is obtained with a toner having photoconductivity for light of the wavelength region in which the electrophotographic level has low photoconductivity.

3,672,888

## PROCESS FOR THE MANUFACTURE OF AN ELECTROPHOTOGRAPHIC SENSITIVE MATERIAL

Haruo Hasegawa, Kinroku Sugiyama, Kikuji Suzuki, and Kunio Hirano, Shizuoka, Japan, assignors to Tomoegawa Paper Manufacturing Co., Ltd.

Filed Mar. 2, 1970, Ser. No. 15,657

Int. Cl. G03g *5/08, 5/10*

U.S. Cl. 96—1.8 5 Claims

An electrophotographic sensitive material wherein a reaction product of synthetic resin having OH-groups and a chromium compound is interposed as an intermediate layer between a photoconductive image-forming layer and a support, such as paper, plastic sheet, thin metallic film and the like and a process for the manufacture thereof.

3,672,889

## ACRYLATE TERPOLYMER RESIN BINDERS FOR PHOTOELECTROSTATIC MEMBERS

Evan S. Baltazzi, Brookfield, Robert G. Blanchette, Elk Grove Village, and Ralph L. Minnis, Des Plaines, Ill., assignors to Addressograph-Multigraph Corporation, Mount Prospect, Ill.

No Drawing. Filed July 14, 1969, Ser. No. 841,545

Int. Cl. G03g *5/08*

U.S. Cl. 96—1.8 5 Claims

A polymeric resin binder for zinc oxide which is a terpolymer formed of ethyl acrylate or ethyl methacrylate, a vinyl-aryl compound such as styrene and an acrylate having amino, hydroxy, or acid functional groups. A typical terpolymer is ethyl acrylate-styrene-hydroxyethyl methacrylate combined in the weight ratio of 69:23:8.

3,672,890

## NOVEL PHOTOGRAPHIC PRODUCTS AND PROCESSES

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of application Ser. No. 782,075, Dec. 9, 1968. This application Aug. 19, 1970, Ser. No. 65,084

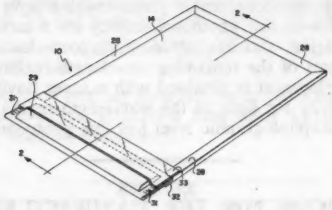
The portion of the term of the patent subsequent to Dec. 10, 1985, has been disclaimed

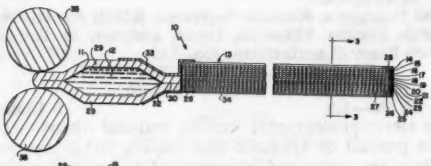
Int. Cl. G03c *1/48, 5/54, 7/00*

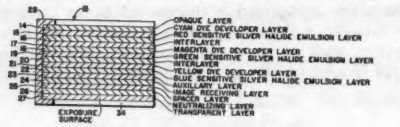
U.S. Cl. 96—3 16 Claims

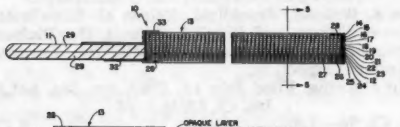
The present invention relates to photography and, more particularly, to reflection type diffusion transfer process

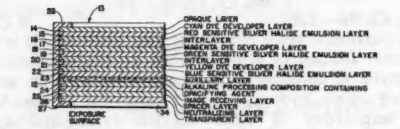
photographic film units which comprise a composite photosensitive element adapted to provide, by diffusion transfer photographic processing, selective integral negative and positive image recordation of incident actinic radiation as a function of the point-to-point degree of photosensitive element exposure, which element includes a plurality of sequential layers including a dimensionally stable layer preferably opaque to incident actinic radiation; a photosensitive silver halide layer having associated therewith dye image-forming material which is diffusible during processing as a function of the point-to-point degree of silver halide layer exposure to incident actinic radiation; a layer adapted to receive image-forming material diffusing thereto; and a dimensionally stable layer transparent to incident radiation.



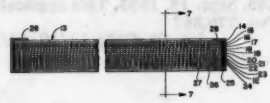


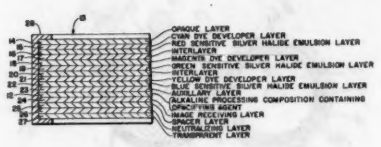





The film units additionally include, in combination, means for interposing, subsequent to photoexposure of the silver halide layer, intermediate the silver halide layer and the reception layer, an opacifying agent in a concentration effective to mask dye image-providing material associated with the photosensitive layer and preferably comprising an inorganic reflecting pigment dispersion containing at least one optical filter agent in a concentration effective to provide a layer exhibiting optical transmission density >~6.0 density units with respect to incident radiation actinic to the photosensitive silver halide layer and optical reflection density <~1.0 density units with respect to reflected visible radiation, and a processing composition possessing a first pH at which the dye image-forming material is diffusible during processing, and means for reducing the pH of the processing composition to a second pH at which the dye image-forming material is substantially nondiffusible subsequent to substantial dye transfer image formation in the reception layer.



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**3,672,891**

## PHOTOGRAPHIC ELEMENT AND PROCESS COMPRISING A PYRIMIDINE SILVER HALIDE DEVELOPING AGENT

**Edwin B. Wyand and William C. Farley, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**No Drawing. Filed Oct. 2, 1969, Ser. No. 863,340**

**Int. Cl. G03c *1/48, 5/30, 5/54***

**U.S. Cl. 96—29 R** **16 Claims**

Photographic developing agents which are pyrimidine compounds such as 5-hydroxy and/or 5-amino-pyrimidine developing agents provide reduced stain without loss of desired sensitometric properties in a diffusion transfer system. These can be used in combination with other photographic developing agents, such as reductone developing agents, aminomethyl hydroquinone developing agents, cinnamic acid developing agents, lactone developing agents, or developing agent precursors e.g. coumarin developing agents or developing agent precursors. They are especially useful in a black-and-white silver salt diffusion transfer process.

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**3,672,892**

## METHOD FOR THE PREPARATION OF A PLANOGRAPHIC PRINTING MASTER

**Marcel Nicolas, Vrancken, Gerald Laurens Vanreusel, Hove, Paul Desire Van Pee, Edegem, and Jules Maria De Laet, Mortsel, Belgium, assignors to Agfa-Gevaert, Mortsel, Belgium**

**No Drawing. Filed June 21, 1968, Ser. No. 738,808**

**Claims priority, application Great Britain, June 21, 1967, 28,693/67**

**Int. Cl. G03f *7/02, 1/00*; G03c *1/72***

**U.S. Cl. 96—33** **12 Claims**

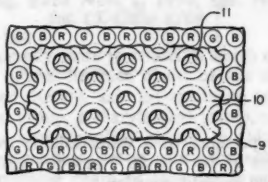
An improvement on U.S.P. 3,476,937 wherein silver halide grains of the internal image-forming type are directly incorporated in the heat-sensitive layer of the basic patent formed by normally solid thermoplastic polymer particles dispersed in a hydrophilic binder so that by exposing the resultant layer to a light image, photographically developing the exposed layer with a photographic developing layer to obtain a direct-positive silver image having a density of at least 0.1 above background, and uniformly exposing the developed layer to radiation absorbed by the silver image and converted into heat, sufficient hydrophobic/hydrophilic differentiation is obtained as to adapt the resultant material for use as a planographic printing master.

3,672,893

## PROCESS OF MANUFACTURING SCREENS FOR SHADOW-MASK TUBES

Ronald C. Robinder, Hanover Park, William A. Rowe, Palatine, and James W. Schwartz, Western Springs, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Aug. 3, 1970, Ser. No. 60,433
Int. Cl. G03c 1/00, 5/00
U.S. Cl. 96—36.1 15 Claims




The screen is covered with a water-soluble coating material comprising a negative photosensitive resist and an inhibitor to render the resist unresponsive to ultraviolet light. An additive, such as a dye that may be bleached or activated by exposure to a visible light wavelength, is also included in the coating to counteract the effect of the inhibitor when activated by exposure. The screen, coated with this material, is first exposed to the visible radiation from one color position and through a shadow mask having apertures larger than the phosphor dots of the screen. The screen is then exposed to ultraviolet, again through the shadow mask but from a second color position and results in elemental areas of the coating material, where the two exposure patterns overlap, being rendered insoluble. The coating pattern is developed by washing the screen with water.

3,672,894

## METHOD FOR MAKING A COMPOSITE BACK PROJECTION SCREEN

William E. Glenn, Jr., Scotia, N.Y., assignor to General Electric Company

Original application Feb. 1, 1967, Ser. No. 613,323. Divided and this application Apr. 27, 1970, Ser. No. 43,275
Int. Cl. G03c 5/00, 11/00, 9/00
U.S. Cl. 96—38.3 3 Claims

Composite back projection screens are described characterized by a cylindrically lenticulated back face and a selectively darkened front face having refracting lens components positioned at the undarkened foci of the back lenticules. The refracting lens components are formed either by selectively notching a Fresnel lens into the flat front face of the projection screen or by lenticulating the front face of the screen and utilizing an appropriate portion of the lenticules' arcual surface as the refracting lens components. Control of both the horizontal and the vertical viewing angles is accomplished by the formation of refracting lens components in both faces of a unitary screen in optical registration with spherical lens components situated along the back face of the unitary screen.

3,672,895

## VACUUM TREATMENT OF COATED, DIRECT-POSITIVE, SILVER HALIDE ELEMENTS

Richard Karl Kurz, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Mar. 25, 1970, Ser. No. 22,697
Int. Cl. G03c 5/24
U.S. Cl. 96—64 6 Claims

This invention relates to processes for improving the photographic properties of fogged, direct-positive, silver halide emulsions. In one aspect, coated, direct-positive emulsions are subjected to a vacuum treatment whereby the maximum density stability is improved upon aging. The $D_{max}$ stability is highly improved in preferred embodiments when electron-acceptor compounds or desensitizers are present in the emulsion.

3,672,896

## PHOTOGRAPHIC COMPOSITION, ELEMENT AND PROCESS

Rolf S. Gabrielsen and Ismael A. Olivares, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Oct. 2, 1969, Ser. No. 863,339
Int. Cl. G03c 1/42, 5/30
U.S. Cl. 96—66 HD 16 Claims

Photographic developing agents which are anhydro dihydro hexose reductone silver halide developing agents provide low stain and improved stability without undesired sensitometric properties in developing a latent image in a photographic element. An aqueous alkaline developer containing, for instance, anhydro dihydro piperidino hexose reductone provides improved properties. The described developing agents can be used in combination with other silver halide developing agents.

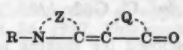
3,672,897

## SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Akira Sato, Hirozo Ueda, and Yoshiaki Ono, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sept. 16, 1969, Ser. No. 858,262
Claims priority, application Japan, Sept. 16, 1968, 43/66,821
Int. Cl. G03c 1/40
U.S. Cl. 96—74 13 Claims

A color photographic light-sensitive material comprising a support having coated thereon a red-sensitive silver halide emulsion layer containing a cyan-color forming coupler, a green-sensitive silver halide emulsion layer containing a magenta-color forming coupler, and a blue-sensitive silver halide emulsion layer containing a yellow forming coupler and a compound represented by the formula



wherein R is a member selected from the group consisting of a sulfoalkyl group and a sulfoaralkyl group, and Z and Q are each an atomic group necessary to complete a heterocyclic nucleus.

3,672,898

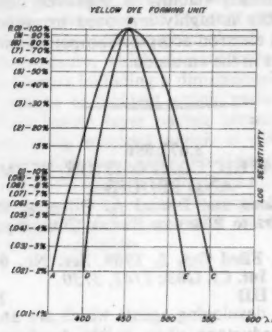
## MULTICOLOR SILVER HALIDE PHOTOGRAPHIC MATERIALS AND PROCESSES

Judith A. Schwan and James L. Graham, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of application Ser. No. 715,005, Mar. 21, 1968. This application Sept. 29, 1969, Ser. No. 864,275
Int. Cl. G03c 1/76, 1/84, 1/10
U.S. Cl. 96—74 42 Claims

Multicolor photographic elements are provided which contain yellow, magenta and cyan dye forming units, each of the units having a relative log spectral sensitivity distribution such that acceptable neutrals and good color rendition are obtained upon exposure of the film to any one of a variety of illuminants, such as daylight, tungsten or fluorescent illuminants. The spectral distribution of each

dye forming unit in accordance with the invention is shown in FIGS. 1–3 and Tables I–III hereof. Photographic proc-




esses utilizing the elements of the invention are also described.

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**3,672,899**

**HIGH CONTRAST PHOTOGRAPHIC MEDIA**

**Jean-Paul C. Archambault, Nashua, N.H., and William S. Holmes, Graniteville, Mass., assignors to Itek Corporation, Lexington, Mass.**

**No Drawing. Filed Nov. 2, 1970, Ser. No. 86,376**
**Int. Cl. G03c *1/00, 1/28***
**U.S. Cl. 96—88** **25 Claims**

The use of arylmercuric compounds provides improved photographic properties to photosensitive materials, particularly in improving the sensitometric properties of photographic images. Such images show markedly higher gamma values. The arylmercuric compounds are especially effective in so-called low-content silver halide film, especially those containing very thin photosensitive layers.

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**3,672,900**

**FOGGED, DIRECT-POSITIVE EMULSION PRODUCTION BY INCREASED FLOW OF SILVER HALIDE-FORMING PRECIPITANTS IN GRAIN-RIPENER-FREE ACIDIC MEDIUM**

**Richard Karl Kurz, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**No Drawing. Filed Aug. 3, 1970, Ser. No. 60,659**
**Int. Cl. G03c *1/02***
**U.S. Cl. 96—94** **8 Claims**

A process is disclosed for making improved, fogged, direct-positive, silver halide emulsions. The silver halide grains of said emulsions are made by forming grains of at least 0.4 micron in size in a precipitation medium which is substantially free of ripening agents and wherein the flow rates of the respective reactants to form said silver halide grains are gradually increased during the growth of said grains. Preferably, the pH is maintained at less than 4 and an oxidizing agent is present during the formation of the grains.

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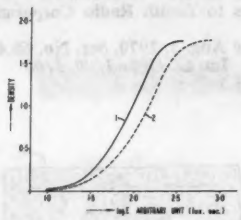
**3,672,901**

**PROCESS OF PRECIPITATING SILVER HALIDE IN THE PRESENCE OF A COLLOID AND A WATER-SOLUBLE IRON SALT**

**Kinji Ohkubo, Junpei Noguchi, and Kunioki Ohmura, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed May 15, 1970, Ser. No. 37,618**
**Claims priority, application Japan, May 17, 1969, 44/38,249**
**Int. Cl. G03c *1/02***
**U.S. Cl. 96—94** **16 Claims**

A process for producing a silver halide photographic emulsion including a step of precipitating a silver halide in a colloidal solution by reaction between a halide and a silver salt, characterized in that said precipitation is




done in the presence of a water-soluble iron compound in an amount of $10^{-7}$ to $10^{-3}$ mol per mol of the silver salt contained in said solution.

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**3,672,902**

**PHOTOGRAPHIC SILVER HALIDE EMULSION WITH IMPROVED SAFE-LIGHT SENSITIVITY**

**Albert Louis van Stappen, Rumson, N.J., and Karl Schwarz, Sprendlingen, Germany, assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**No Drawing. Filed Aug. 12, 1970, Ser. No. 63,286**
**Claims priority, application Germany, Nov. 12, 1969, P 19 56 774.9**
**Int. Cl. G03c *1/28, 1/36***
**U.S. Cl. 96—107** **8 Claims**

Light-sensitive silver halide emulsions containing mixtures of a diphenyldisulfide carboxylic acid, a polyhydroxyspiro-bis-indane, a developing agent and a poly-(alkylene oxide) compound. The emulsions have improved light-sensitivity with reduced sensitivity to safe-light illumination.

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**3,672,903**

**DIRECT-POSITIVE SILVER HALIDE EMULSIONS CONTAINING GOLD SALT COMPLEX ADDENDA**

**Elizabeth Puiu Chang, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**No Drawing. Filed Feb. 16, 1970, Ser. No. 11,837**
**Int. Cl. G03c *1/28, 1/30***
**U.S. Cl. 96—108** **12 Claims**

Gold salt complexes can be added to fogged, direct-positive silver halide emulsions to improve their photographic properties, especially the maximum density upon aging. Preferably, the emulsions of this invention contain reduction and gold fogged silver halide grains.

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**3,672,904**

**PHOTOTHERMOGRAPHIC ELEMENTS CONTAINING BIS-BETA-NAPHTHOLS**

**Richard A. de Mauriac, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**No Drawing. Filed May 1, 1970, Ser. No. 33,964**
**Int. Cl. G03c *1/02***
**U.S. Cl. 96—114.1** **14 Claims**

A reducing agent, such as a bis-naphthol, in combination with an activator-toning agent, such as a cyclic imide, in a photosensitive and thermosensitive element suitable for dry processing with heat, provides improved pre-processing incubation stability, increased sensitivity including reduced exposure and processing time, more neutral maximum density areas and greater image stability. A combination of a bis-naphthol reducing agent and a cyclic-imide activator-toning agent in conjunction with a stable source of silver for physical development are useful in photosensitive elements for dry processing. The element

can contain a sensitizing dye and a stable, developed image can be provided by heating the element after exposure. The photosensitive component can be photographic silver halide, or other suitable photosensitive metal salts.

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3,672,905

## NOVEL DYES AND PHOTOGRAPHIC EMULSIONS

Roy A. Jeffreys and Susan M. Mellows, Harrow, England, assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Nov. 2, 1970, Ser. No. 86,316
Int. Cl. G03c *1/08*
U.S. Cl. 96—140 4 Claims

Novel methine dyes are provided in which one terminal carbon atom of the methine chain of the dye has two groups attached thereto, said groups being selected from a dialkylamino group, a diarylamino group, an alkylarylamino group, a morpholino group, a thiomorpholino group and a piperidino group; and, the other terminal atom of the methine chain of said dye is attached to a heterocyclic nucleus of the type used in methine dyes. The preparation of such dyes, and photographic emulsions containing them, are also provided herein.

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3,672,906

## SILVER HALIDE EMULSIONS SENSITIZED WITH METHINE DYES CONTAINING A CYCLOPENTANONE NUCLEUS

Leslie G. S. Brooker, Rochester, and Arthur Fumia, Jr., Hilton, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 656,647, July 28, 1967. This application Mar. 25, 1970, Ser. No. 22,707
Int. Cl. G03c *1/08*
U.S. Cl. 96—142 8 Claims

Novel methine dyes containing a cyclopentanone nucleus in the methine chain are prepared by the acid hydrolysis of cyanine enamine derivatives. These methine dyes are spectral sensitizers for photographic silver halide emulsions. A number of the new dyes extend the sensitivity of photographic silver halide emulsions into the red and near infra-red regions of the spectrum.

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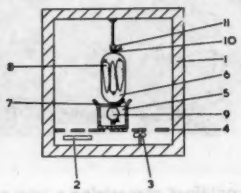
3,672,907

## METHOD OF THERMALLY PROCESSING A COMESTIBLE PRODUCT

Ronald Augustus Hudson, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 19, 1970, Ser. No. 4,013
Claims priority, application Great Britain, Jan. 30, 1969, 5,226/69
Int. Cl. A23l *3/10*; A23b *1/00*
U.S. Cl. 99—1 5 Claims




Packaging and thermally processing foods etc. by enclosing them with a small amount of water in a sealed flexible plastic container, separating the water into a portion of the container, and heating only the water, preferably by microwave or radio frequency heating, to process the product by steaming.

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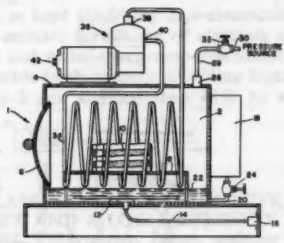
3,672,908

## METHOD OF HEAT PROCESSING FOOD

Jack O. Hice, Sr., Fort Lauderdale, Fla. (231 Commercial Blvd., Lauderdale-by-the-Sea, Fla. 33308)

Continuation-in-part of application Ser. No. 585,230, Oct. 17, 1966. This application Apr. 8, 1970, Ser. No. 26,728
Int. Cl. A22c *18/00, 25/00*
U.S. Cl. 99—1 17 Claims



A method of heat treating food including the steps of subjecting the food to be heat treated to superatmospheric pressure in a gaseous atmosphere prior to the application of heat to the food, applying heat to the food while maintaining the superatmospheric pressure on the food, rapidly cooling the food after the food has been heat treated to a desired extent, and removing the gaseous atmosphere under superatmospheric pressure from the food; and apparatus for practicing the method.

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3,672,909

## METHOD OF DENSIFYING FOOD PRODUCTS

Robert E. Berry, Owen W. Bissett, and Charles J. Wagner, Jr., Winter Haven, and Eldridge P. Patterson, Lakeland, Fla., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Continuation of application Ser. No. 670,803, Sept. 26, 1967. This application Sept. 30, 1970, Ser. No. 76,967
Int. Cl. A23l *1/10*
U.S. Cl. 99—1 6 Claims

This invention relates to a method whereby powders of a porous nature which have a very low density and a very high bulk can be converted to powders of a higher density and lower bulk. More particularly, this invention relates to a method whereby a dry porous powder of a low bulk density is ground to a given particle size range and then fed into the nip of hard steel rolls where it is subjected to high pressures and where after such compression it is formed into flakes having from 3 to 4 times the bulk density of the original material.

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3,672,910

## BLOOD PRODUCT FOR FISH BAIT

R. D. Moore, Jacksonville, Tex., assignor to R-J-R, Corp.

No Drawing. Filed June 8, 1970, Ser. No. 44,646
Int. Cl. A01n *17/14*
U.S. Cl. 99—3 2 Claims

A manufactured fish bait made from fresh warm animal blood by mixing a gelling agent with the warm blood, permitting the mixture to solidify, draining and air drying the resulting product, and suitably packaging the blood product for subsequent use as a fish bait. Where deemed

desirable, the product can be improved by the addition of anise, charcoal, sodium chloride, and sodium bicarbonate.

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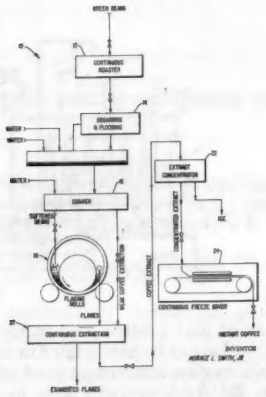
**3,672,911**
**METHOD FOR PRODUCING SOLUBLE COFFEE CONCENTRATES**
**Horace L. Smith, Jr., Richmond, Va., assignor to Smitherm Industries, Inc., Richmond, Va.**
**Filed Dec. 14, 1970, Ser. No. 97,942**
**Int. Cl. A23f 1/08**
**U.S. Cl. 99—71** **11 Claims**



The production of a soluble coffee concentrate by roasting green beans, softening and flaking the roasted beans and thereafter extracting the coffee solubles from them, concentrating the extract, and freeze drying the extracted solubles in the concentrate.

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**3,672,912**
**TORTILLA AND PROCESS USING WATER SOLUBLE EDIBLE BORATE OR ALUMINATE**
**Manuel Jesus Rubio, Bridgeport, Conn., assignor to Roberto Gonzalez Barrera, Monterrey, Nuevo Leon, Mexico**
**No Drawing. Filed July 24, 1970, Ser. No. 58,137**
**Int. Cl. A23l 1/10**
**U.S. Cl. 99—80** **9 Claims**

To retard the staling of tortillas, which are an unleavened unshortened food product made from nixtamalized corn or corn flour and to increase the yield of dough and tortillas by incorporating an additive in making the tortilla dough. The additive is water soluble edible borate or aluminate.

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**3,672,913**
**METHOD FOR THE CONTINUOUS MANUFACTURE OF LINKED SAUSAGE PRODUCTS**
**Everett V. Podebradsky, Madison, Wis., assignor to Oscar Mayer & Company, Inc., Madison, Wis.**
**No Drawing. Filed May 25, 1970, Ser. No. 40,372**
**Int. Cl. A22c 11/00; A23b 1/04**
**U.S. Cl. 99—109** **6 Claims**

When enough liquid smoke is used in the manufacture of weiners and smoky links to facilitate machine peeling of skins, an undesirable flavor and brown color tends to be imparted to the sausage. Addition of mono and/or di-saccharides in an amount between 15% and 40% to the liquid smoke eliminates this problem.

**3,672,914**
**CONDIMENT CONTAINING SODIUM DIACETATE**
**William E. Delaney, Chicago, Ill., assignor to Kadison Laboratories, Inc., Chicago, Ill.**
**No Drawing. Filed Aug. 11, 1970, Ser. No. 63,040**
**Int. Cl. A23l 1/22; C12j 1/00**
**U.S. Cl. 99—140 R** **8 Claims**

A dry, pulverulent, free flowing condiment which comprises a mixture of sodium chloride and sodium diacetate having a solid coating of an edible, non-hygroscopic, water-soluble material, in conjunction with other ingredients.

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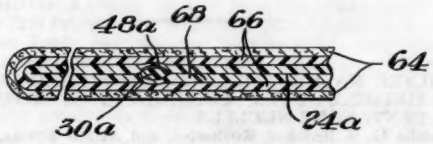
**3,672,915**
**PRESSURE RELEASE VALVE FOR FLEXIBLE POUCHES**
**Glenn C. Wiggins, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.**
**Continuation-in-part of application Ser. No. 780,767, Dec. 3, 1968. This application Apr. 10, 1970, Ser. No. 27,412**
**Int. Cl. B65d 31/14, 85/00**
**U.S. Cl. 99—171 LP** **15 Claims**




In a package including a flexible pouch, the pouch normally comprising a tubular body and strip seals closing the opposite ends of the tubular body, the improvement of which comprises, a one way pressure release valve comprising an interiorly disposed element such as a monofilament or strand anchored its opposite ends, respectively, by securement with the layers of the pouch at the strip seal areas. A valving or venting action occurs when a face region of one of the element ends releases from the adjacent layer in the seal.

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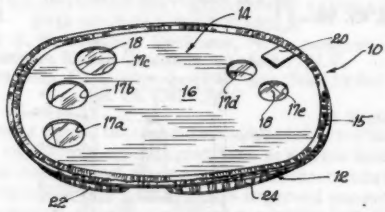
**3,672,916**
**FOOD TRAY HAVING A LAMINATED CLOSURE THAT IS HEAT-RETRACTABLE**
**Herbert J. Virnig, Hanover Park, Ill., assignor to Mass Feeding Corporation, Elk Grove Village, Ill.**
**Filed Aug. 31, 1970, Ser. No. 68,432**
**Int. Cl. B65b 25/22**
**U.S. Cl. 99—171 H** **10 Claims**




A food container comprising a tray portion and a complementary closure member, said closure member comprising in sheetlike laminated form, a sheetlike support member of relatively heat insensitive material having one or more apertures of predetermined size formed therein

and a film member of heat sensitive thermoplastic polymeric material secured and laminated to one surface of said support member and extending over said aperture or apertures providing a moisture vapor barrier in said closure member which is heat reactive at normal cooking oven temperatures.

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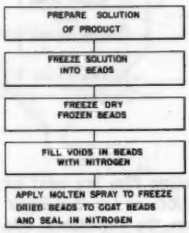
3,672,917
**METHOD OF IMPROVING QUALITY AND STORAGE STABILITY OF DEHYDRATED PRODUCTS**
Charles M. Buchzik, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.
Filed Aug. 15, 1969, Ser. No. 850,583
Int. Cl. A23f *1/06;* F26 *3/10*
U.S. Cl. 99—199 10 Claims


PREPARE SOLUTION OF PRODUCT
FREEZE SOLUTION INTO BEADS
FREEZE DRY FROZEN BEADS
FILL VOIDS IN BEADS WITH NITROGEN
APPLY MOLTEN SPRAY TO FREEZE DRIED BEADS TO COAT BEADS AND SEAL IN NITROGEN

An aqueous solution of soluble food concentrate is sprayed into chilled hexane or water immiscible liquids to freeze the concentrate into beads. The beads are freeze dried to remove ice therefrom by sublimation in a subatmospheric pressure chamber. The freeze dried beads are sealed in a chamber from which the air is removed. Nitrogen is introduced to the chamber and is heated to pass through a screen which supports the freeze dried beads. The nitrogen enters voids in the beads and is sealed therein by a coating of coconut-oil fat, with or without addition of antioxidants, the coconut-oil fat being sprayed into the chamber and carried to the beads by the stream of warm nitrogen.

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3,672,918
**HOT TOPS**
George Rocher and Nicholas Orban, Pittsburgh, Pa., assignors to Metallurgical Exoproducts Corporation, McKees Rocks, Pa.
Filed Sept. 14, 1970, Ser. No. 71,824
Int. Cl. B28b *7/34;* B22d *7/10*
U.S. Cl. 106—38.22 5 Claims

A composite hot top board comprising an exothermic layer and an insulating layer bonded together wherein there is a substantial number of randomly spaced, discontinuous and internal voids or a substantial amount of space at the interface between the two layers. Preferably, the voids are formed in situ under use conditions by the decomposition of certain additives in the insulating layer.

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3,672,919
**SEALING GLASS HAVING HIGH ABSORPTION OF INFRARED RADIATION**
Werner Sack, Mainz-Gonsenheim, Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Germany
Filed Sept. 19, 1969, Ser. No. 859,594
Claims priority, application Germany, Sept. 25, 1968, P 17 96 232.2
Int. Cl. C03c *3/04, 3/10, 3/08*
U.S. Cl. 106—52 14 Claims

Glass which is heat absorbing and electrically highly insulating and suitable for sealing of elements of nickel-chromium-iron and nickel-manganese-iron alloys containing iron (II) oxide in an amount providing high infrared absorption at 1–2 μm. and less than 20% by weight of PbO.

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3,672,920
**OPTICAL GLASS HAVING A HIGH REFRACTIVE INDEX AND A LOW DISPERSION**
Hachiro Ishiguri, Tokorozawa, Japan, assignor to Hoya Glass Works, Limited, Tokyo, Japan
Filed May 26, 1970, Ser. No. 40,553
Claims priority, application Japan, May 27, 1969, 44/41,260
Int. Cl. C03c *3/12, 3/14, 3/30*
U.S. Cl. 106—47 Q 1 Claim

An optical glass having a high refractive index, a low dispersion and a high stability during melting can be produced by adding 5–10 weight percent of MgO to a composition of the $B_2O_3$-$La_2O_3$-$ThO_2$ system optionally containing $SiO_2$, $ZrO_2$ and/or $Ta_2O_5$.

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3,672,921
**GLASS FOR ULTRASONIC DELAY LINE**
Yoshiyuki Asahara, Kawasaki, and Tetsuro Izumitani, Tokyo, Japan, assignors to Hoya Glass Works, Limited, Tokyo, Japan
Filed May 19, 1970, Ser. No. 38,797
Claims priority, application Japan, May 24, 1969, 44/40,454
Int. Cl. C03c *3/04, 3/10;* H03h *7/30*
U.S. Cl. 106—53 2 Claims

An ultrasonic delay line glass having improved temperature-coefficient and time dependencies of delay time and stability during melting can be obtained by incorporating $B_2O_3$ into a glass composition of the $SiO_2$-$K_2O$-PbO system and reducing a content of $K_2O$.

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3,672,922
**BENZYL STARCH EMULSION COATING COMPOSITIONS**
Robert E. Brouilliard, Leonard J. Coughlin, and Vernon L. Winfrey, Cedar Rapids, Iowa, assignors to Penick & Ford Limited, Cedar Rapids, Iowa
No Drawing. Filed Jan. 26, 1970, Ser. No. 5,972
Int. Cl. C08b *25/02*
U.S. Cl. 106—211 8 Claims

An oil-in-water emulsion coating composition for imparting brightness and/or opacity to publication paper, boxboard and the like utilizes a combination binder and emulsifier in the water phase, consisting essentially of dispersed particles of benzyl starch containing from 2 to

20% of ether-linked benzyl groups. Preferably, the starch contains from 5 to 12% benzyl groups. The composition can be utilized as a "bubble" coating.

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**3,672,923**
**SOLID PRECIOUS METAL SENSITIZING COMPOSITIONS**

**Rudolph J. Zeblisky, Hauppauge, N.Y., assignor to Photocircuits Division of Kollmorgen Corporation, Hartford, Conn.**

**No Drawing. Continuation-in-part of application Ser. No. 9,060, Feb. 5, 1970, which is a continuation-in-part of application Ser. No. 801,167, Feb. 20, 1969, which is a continuation-in-part of application Ser. No. 712,575, Mar. 12, 1968, which is a continuation of application Ser. No. 551,249, May 19, 1966, which is a continuation of application Ser. No. 285,889, June 6, 1963, which in turn is a continuation of application Ser. No. 53,352, Sept. 1, 1960. This application June 29, 1970, Ser. No. 50,918**

**Int. Cl. C23c** *3/02*

**U.S. Cl. 106—286** **18 Claims**

Solid compositions dilutable to optically clear sensitizing solutions for rendering surfaces receptive to the deposition of an adherent electroless metal comprise a metal complex consisting of (a) a precious metal selected from a group consisting of the precious metals of the fifth and sixth periods of Groups VIII and I–B of the Periodic Table of Elements, (b) a Group IV metal of the Periodic Table of Elements which is capable of two valence states and (c) an anion capable of forming a stable moiety with both valence states of the Group IV metal, in which the molar ratio of (a) to (b) to (c) is from about 1:1:3 to 1:6:24. The solutions can be prepared by diluting the solid compositions. Controlled excesses of (b) and (c) and hydrogen ion and wetting agents enhance the solubility of the powdered product and stability of the diluted solutions. Processes for rendering surfaces receptive to the deposition of an electroless metal, e.g., copper, nickel, cobalt, palladium, gold and silver, are also provided.

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**3,672,924**
**THERMALLY STABLE AIR FILTER GELS**

**James P. Hamilton, Pasadena, Md., assignor to FMC Corporation, New York, N.Y.**

**No Drawing. Continuation-in-part of application Ser. No. 16,560, Mar. 4, 1970, which is a continuation-in-part of abandoned application Ser. No. 654,714, July 20, 1967. This application Oct. 23, 1970, Ser. No. 83,632**

**Int. Cl. C09k** *1/04*

**U.S. Cl. 106—287** **7 Claims**

Thermally stable triorganic phosphate coating compositions for viscous-impingement air filters are prepared by thickening 100 parts of a triorganic phosphate with a combination of 0.5 to 5 parts of a pure pyrogenic silica with 0.5 to 7 parts by weight of a hydrated salt, aluminum distearate or synthetic calcium silicate.

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**3,672,925**
**METHOD OF PREPARING A SUBSTRATE FOR DEPOSITING A METAL ON SELECTED PORTIONS THEREOF**

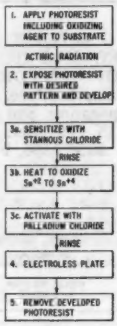
**Nathan Feldstein, Kendall Park, N.J., assignor to RCA Corporation**

**Filed Oct. 2, 1970, Ser. No. 77,440**

**Int. Cl. B44d** *1/52, 1/18*

**U.S. Cl. 117—5.5** **12 Claims**

A method of preparing a substrate for the deposition of a metal on selected portions of the substrate surface by electroless plating, in the presence of a catalyst, comprises first covering the unselected portions of the substrate surface with a masking film that includes an oxidizing agent. The substrate, including the masking film, is then treated with a sensitizing solution and heated to cause the oxidizing agent to oxidize, and desensitize, the sensitizing solution that is adsorbed on the masking film, rendering the masking film incapable of accepting a catalyst. The substrate and masking film are next treated with a catalytic activating solution, and a thin layer of the catalyst is deposited only on the sensitized selected portions of the substrate surface.


1. APPLY PHOTORESIST INCLUDING OXIDIZING AGENT TO SUBSTRATE
ACTINIC RADIATION
2. EXPOSE PHOTORESIST WITH DESIRED PATTERN AND DEVELOP
3a. SENSITIZE WITH STANNOUS CHLORIDE
RINSE
3b. HEAT TO OXIDIZE $Sn^{+2}$ TO $Sn^{+4}$
3c. ACTIVATE WITH PALLADIUM CHLORIDE
RINSE
4. ELECTROLESS PLATE
5. REMOVE DEVELOPED PHOTORESIST

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**3,672,926**
**PROCESS FOR PRODUCING DECORATIVE SIMULATED INLAY**

**David S. Ramey, Winston-Salem, N.C., assignor to Multicraft, Incorporated, Winston-Salem, N.C.**

**Continuation-in-part of application Ser. No. 677,311, Oct. 23, 1967. This application Mar. 30, 1970, Ser. No. 23,561**

**Int. Cl. B44c** *1/24, 5/04;* **B44d** *1/52*

**U.S. Cl. 117—8** **10 Claims**

A simulated inlay is produced on an exposed surface of a finished receiving material such as wood, by a method in which an exposed surface of the material is scored to form grooves therein outlining the configuration of the simulated inlay, a first characteristic appearance is imparted to certain areas by printing on only certain predetermined areas of the exposed surface, and the entire surface is thereafter subjected to a finishing operation which imparts to other areas thereof a characteristic appearance contrasting with the appearance of the printed areas. An article to be decorated by such simulated inlay is produced by preparing a panel with certain areas printed in such a manner with respect to grooves outlining a simulated inlay, incorporating the panel into an article of furniture, and thereafter finishing the entire surface of the panel with the article.

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**3,672,927**
**ELECTROSTATIC COATING METHOD**

**Lester L. Spiller and Stephen J. Smith, Indianapolis, Ind., assignors to Ransburg Electro-Coating Corp., Indianapolis, Ind.**

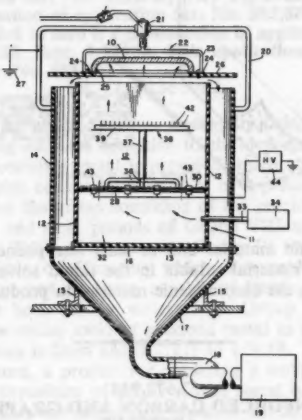
**Continuation of application Ser. No. 530,473, Feb. 28, 1966. This application Oct. 29, 1969, Ser. No. 873,761**

**Int. Cl. B05b** *5/00;* **B44d** *1/095*

**U.S. Cl. 117—17** **10 Claims**

A conductive sensitized binder comprising a polymerizable binder material such as polyvinyl alcohol and a metallic salt such as ammonium dichromate dissolved in a water soluble alcohol and water is applied to a nonconductive surface of a television picture tube. Electrostatically charged phosphor particles are placed adjacent the tube surface. The conductive coating of sensitized

binder is maintained at particle-attracting potential. Particles are electrostatically deposited on the conductive sensitized binder, which is activated, affixing the particles. One method of depositing phosphor particles includes projecting the particles from a fluidized bed toward the



conductively coated tube surface and establishing an electrostatic field to the conductive coating from an electrode to electrostatically charge and deposit the phosphor particles. The television picture tube and the electrode may be moved relative to each other during deposition.

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**3,672,928**

## ELECTROSTATOGRAPHIC DEVELOPERS HAVING CARRIERS COMPRISING POLYESTER COATED CORES

**Robert William Madrid, Macedon, and Robert Joseph Hagenbach, Rochester, N.Y., assignors to Xerox Corporation, Rochester, N.Y.**

**Filed Feb. 3, 1970, Ser. No. 8,412**
**The portion of the term of the patent subsequent to Oct. 13, 1987, has been disclaimed**
**Int. Cl. G03g *9/02***
**U.S. Cl. 117—17.5** **10 Claims**

A carrier for electrostatographic developer mixtures is provided comprising a core coated with a polyester prepared from diallyl phthalate, diallyl isophthalate or diallyl chlorendate or prepolymers thereof.

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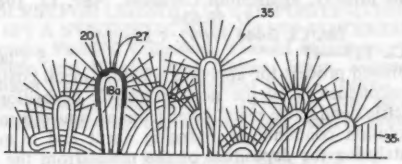
**3,672,929**

## FLOCKED OPEN LOOPED PILE FABRIC AND METHOD OF MAKING SAME

**Vincent P. Riordan, Westwood, Mass., assignor to Microfibers, Inc., Pawtucket, R.I.**

**Filed Dec. 10, 1970, Ser. No. 96,714**
**Int. Cl. B44c *1/08*; D06c *11/00***
**U.S. Cl. 117—25** **8 Claims**



A flocked fabric comprising an open looped pile fabric base having some loops permanently and substantially raised from the major surface of the base fabric, and flock fibers adhered to this fabric.

**3,672,930**

## PROCESS OF TRANSFERRING AN ELECTROSTATIC CHARGE PATTERN WITHOUT USING EXTERNAL PRESSURE OR ELECTRICAL BIAS

**William Trachtenberg, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**No Drawing. Filed Apr. 2, 1970, Ser. No. 25,246**
**Int. Cl. G03g *13/18***
**U.S. Cl. 117—37 LE** **13 Claims**

A high resolution process of transferring and developing electrostatic charge patterns is described. An electrostatic charge pattern is formed on an image-bearing member having a very low Sheffield Smoothness value. A receiving element is provided which also has a low Sheffield Smoothness value. The smooth surfaced member is then placed in face-to-face contact with the receiving element in the presence of a thin layer of an electrically insulating isoparaffinic hydrocarbon transfer liquid having a boiling point in the range of 105 to 260° C. During contact, the charge pattern is transferred to the receiving element in the absence of external pressure or electrical bias potential. The transferred image is then developed to form a high resolution visible image.

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**3,672,931**

## METHOD OF FORMING PHOSPHOR SCREEN

**Patrick F. Grosso, Stamford, and Raymond F. Heck, Norwalk, Conn., assignors to Columbia Broadcasting System, Inc.**

**Filed July 27, 1970, Ser. No. 58,290**
**Int. Cl. H01j *29/26***
**U.S. Cl. 117—33.5 CP** **9 Claims**

A high quality, uniform textured luminescent screen suitable for use in a high resolution cathode ray tube or the like is produced by successively depositing by settling two or more separate layers of phosphor.

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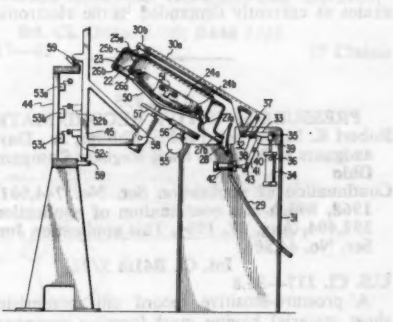
**3,672,932**

## PROCESS FOR SCREENING CATHODE RAY TUBES INCLUDING SALVAGING OF EXCESS PHOSPHOR SLURRY

**Frank Thomas D'Augustine, Lancaster, Pa., assignor to RCA Corporation**

**Filed June 24, 1969, Ser. No. 836,017**
**Int. Cl. B05c *11/10*; C03c *17/10***
**U.S. Cl. 117—33.5 C** **2 Claims**



A process for making a phosphor screen for a cathode ray tube having a faceplate panel which is in one of a

plurality of size ranges. First, a quantity of phosphor slurry in excess to that required for the screen is dispensed into the panel. The size range of the panel is sensed and a slurry collector means of the proper size is selected from a plurality of such collector means and moved into a salvage position with respect to the panel. The phosphor slurry is spread over the inner surfaces of the panel and the panel is spun to fling the excess slurry therefrom into said slurry collection means. Then, the excess slurry is recovered from the slurry collection means.

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**3,672,933**

## PREPARATION OF PHOTOSENSITIVE COATED PAPERS BY SINGLE PASS PER SIDE

**Marvin Frank Lieberman, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**No Drawing. Filed Nov. 30, 1970, Ser. No. 93,890**

**Int. Cl. B44d *1/02***

**U.S. Cl. 117—34** **9 Claims**

Photosensitive papers such as proofing paper, imageable on both sides, are produced by (a) first coating one side with a composition comprising a volatile organic solvent and a film-forming polymeric binder, and photosensitive ingredients, followed by drying to evaporate the solvent at a controlled rate, thereby forming a film, then (b) coating the second side with the same composition in a single coating application, and drying under the comparable conditions to the first side. Careful control of the coating conditions, drying steps, volatile organic solvents, polymeric binders, photosensitive compositions and paper substrates yield blister-free, two-side coated, photosensitive papers.

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**3,672,934**

## METHOD OF IMPROVING LINE RESOLUTION IN SCREEN PRINTING

**John R. Larry, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**No Drawing. Continuation-in-part of abandoned application Ser. No. 886,035, Dec. 17, 1969. This application May 1, 1970, Ser. No. 33,875**

**Int. Cl. B44d *1/16*; B41m *1/12***

**U.S. Cl. 117—38** **13 Claims**

The invention relates to decreasing the wettability of the screen and/or substrate surfaces used in screen printing by treating at least one of said surfaces with a fluorinated organic compound which reduces the surface energy of the treated surface. The object is to coat the surfaces which contact the screen printing paste whereby any spreading of the paste on the substrate is significantly reduced. This process provides a means for screen printing fine line patterns onto conventional substrates as currently demanded in the electronic industry.

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**3,672,935**

## PRESSURE-SENSITIVE RECORD MATERIAL

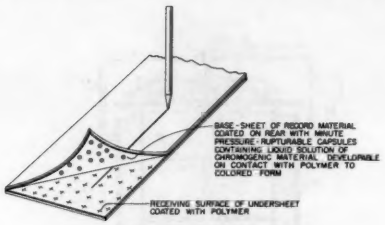
**Robert E. Miller and Paul S. Phillips, Jr., Dayton, Ohio, assignors to National Cash Register Company, Dayton, Ohio**

**Continuation of application Ser. No. 744,601, June 17, 1968, which is a continuation of application Ser. No. 392,404, Aug. 27, 1964. This application June 9, 1970, Ser. No. 44,805**

**Int. Cl. B41m *5/22***

**U.S. Cl. 117—36.8** **9 Claims**

A pressure-sensitive record unit comprising support sheet material having mark-forming components and a pressure-releasable liquid solvent for said mark-forming components arranged in contiguous juxtaposition on said sheet material, at least one of the mark-forming components being maintained in isolation from the other mark-forming component(s) prior to release of the solvent, and said mark-forming components comprising at least one


BASE - SHEET OF RECORD MATERIAL
COATED ON REAR WITH MINUTE
PRESSURE - RUPTURABLE CAPSULES
CONTAINING LIQUID SOLUTION OF
CHROMOGENIC MATERIAL, DEVELOPABLE
ON CONTACT WITH POLYMER TO
COLORED FORM
RECEIVING SURFACE OF UNDERSHEET
COATED WITH POLYMER

chromogenic material and at least one phenol-aldehyde polymeric material soluble in the liquid solvent and reactive with the chromogenic material to produce a mark.

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**3,672,936**

## REINFORCED CARBON AND GRAPHITE ARTICLES

**Leo C. Ehrenreich, Buffalo, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.**

**No Drawing. Filed Apr. 18, 1968, Ser. No. 722,158**

**Int. Cl. C23c *9/06, 13/00*; B44d *1/46***

**U.S. Cl. 117—46 CC** **23 Claims**

A reinforced carbon article which comprises a carbon fiber shape bonded by a carbon binder and having incorporated within said article the in situ reaction product of carbon and a boron containing additive which comprises a material selected from the group consisting of boron, boron nitride, boron silicide and refractory metal borides; and the process of making said article which comprises forming a carbon fiber shape, dispersing the boron containing additive within at least a portion of said carbon fiber shape, impregnating said carbon fiber shape with a carbonizable binder, and heating said shape to carbonize the binder and to form in situ the reaction product of carbon and said boron containing additive.

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**3,672,937**

## PROCESS FOR THE NON-ELECTROLYTIC METALLIZING OF NON-CONDUCTORS

**Gottfried Kallrath, Stiftstrasse 5, Bruhl-Vochem, Germany; Helmut Knorre, Martinstrasse, Hainstadt am Main, Germany; Eugen Meyer-Simon, Bertha-von-Suttner-Ring 3a, Frankfurt am Main, Germany; and Hanns Biegler, Josef Zimmermannstr. F, Wesseling, near Cologne, Germany**

**No Drawing. Continuation of application Ser. No. 593,736, Nov. 14, 1966. This application Feb. 4, 1970, Ser. No. 12,888**

**Claims priority, application Germany, Nov. 12, 1965, D 48,636**

**Int. Cl. B44d *1/092*; C23c *3/02***

**U.S. Cl. 117—47** **5 Claims**

Improved process for applying adherent metal coatings to non-conductors by the non-electrolytic deposition of an electric conductive metal layer from an aqueous metal salt solution containing a reducing agent and a metal for catalyzing the deposition of the metal from the salt solution wherein the non-conductor to be metallized has incorporated therein a finely divided filler having functional groups capable of chemically binding the catalytic metal and of imparting the degree of roughness to the non-conductor surface required for the metallization.

3,672,938
## NOVEL PRECIOUS METAL SENSITIZING SOLUTIONS

Rudolph John Zeblisky, Happauge, N.Y., assignor to Kollmorgen Corporation

No Drawing. Continuation-in-part of application Ser. No. 712,575, Mar. 12, 1968, which is a continuation of application Ser. No. 551,249, May 19, 1966, which is a continuation of application Ser. No. 285,889, June 6, 1963, which in turn is a continuation of application Ser. No. 53,352, Sept. 1, 1960. This application Feb. 20, 1969, Ser. No. 801,167

Int. Cl. C23c *3/02*

U.S. Cl. 117—47 A 11 Claims

A new and useful precious metal sensitizing solution for rendering surfaces receptive to the deposition of an adherent electroless metal is provided which comprises a metal complex consisting essentially of a precious metal selected from the group consisting of the precious metals of the fifth and sixth periods of Group VIII and I–B of the Periodic Table of Elements, a Group IV metal of the Periodic Table of Elements which is capable of two valence states and an anion capable of forming a stable moiety with both valence states of the Group IV metal, in which the molar ratio of precious metal to Group IV metal to anion is from about 1:1:3 to 1:3:19.

Furthermore, a process for rendering a surface receptive to the deposition of an electroless metal is also provided in which the sensitizing solution hereinabove defined is employed.

3,672,939
## ELECTROLESS PROCESS FOR FORMING THIN METAL FILMS

Richard G. Miller, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed June 2, 1969, Ser. No. 829,755

Int. Cl. B44d *1/08;* C03c *17/10*

U.S. Cl. 117—54 20 Claims

The invention described herein relates to an electroless process for forming thin metal films, particularly transparent films, on a reactive substrate. It particularly relates to a method of spraying two alkaline solutions—one containing a chelated metal salt and the other containing a reducing agent—onto a reactive substrate to form a metal film by reduction of the metal salt. More particularly, the invention relates to an electroless process for forming metal films of metals contained in Groups I*b* and VIII of the Periodic Table, especially iron, cobalt, and nickel, by forming an alkaline solution of soluble chelated salts of said metals in an aqueous media, preferably including boric acid, and spraying said solution on a reactive substrate at substantially the same time that an alkaline solution of a boron-containing reducing agent, especially alkali metal borohydrides, is sprayed on the substrate. The invention has been found to be particularly useful for forming transparent films of cobalt, nickel, iron, and the like on sensitized transparent substrates such as glass and plastic.

3,672,940
## PROCESS FOR CHEMICALLY DEPOSITING NICKEL ON A SYNTHETIC RESIN BASE MATERIAL

Kiyotaka Funada, Chigasaki, Takashi Shinohara, Yokohama, and Hiroko Imai, Tokyo, Japan, assignors to Nihon Kagaku Kizai Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Aug. 3, 1970, Ser. No. 60,628

Claims priority, application Japan, Aug. 8, 1969, 44/62,687

Int. Cl. B44d *1/092;* C23c *3/02*

U.S. Cl. 117—47 A 7 Claims

A process for the chemical deposition of nickel on a synthetic resin base material, characterized by etching the resin base material in a new etching solution containing a palladium compound as the additive thereby eliminating the conventional sensitizing and activating treatments, and chemically depositing nickel on the etched resin base material from a new chemical nickel plating bath containing as the additives a water-soluble lead compound and a second reducing compound such as ascorbic acid, thereby obtaining the new plating bath having a better plating capability and longer lifetime.

3,672,941
## PROCESS FOR PREPARING A PIGMENT COATED PAPER

Kozo Konishi, Michio Otake, Tatuo Maeda, and Kuniaki Maruyama, Mishi Kubiki-gun, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed July 28, 1969, Ser. No. 845,573

Claims priority, application Japan, July 31, 1968, 43/53,591; Nov. 15, 1968, 43/83,262

Int. Cl. B44d *1/44;* D21h *1/20*

U.S. Cl. 117—62 3 Claims

A paper coating pigment binder composition having an improved flowability and water-resistant property and a process thereof can be completed by using as a pigment binder composition a saponified product of vinyl acetate-acryl amide copolymer or a copolymer of vinyl acetate, acryl amide and one or more other copolymerizable monomer, with the co-use of aqueous zinc salt or aluminum solution.

3,672,942
## PROCESS FOR IMPREGNATING POROUS METAL ARTICLES

Edward W. Neumann, Raleigh, N.C., and Richard Borowski, New Britain, Conn., assignors to Loctite Corporation, Newington, Conn.

No Drawing. Continuation-in-part of application Ser. No. 790,873, Jan. 13, 1969. This application Dec. 24, 1969, Ser. No. 888,060

Int. Cl. B44d *1/34*

U.S. Cl. 117—62.2 15 Claims

Porous articles can be sealed and impregnated without heat cure by (1) impregnating the article with the anaerobic combination of an acrylate monomer and a redox catalyst system; and (2) following the impregnation step by treating the impregnated article with an accelerator of free radical polymerization.

3,672,943
## PROCESS FOR THE PRODUCTION OF AN ARTIFICIAL LEATHER AND THE RESULTANT PRODUCT

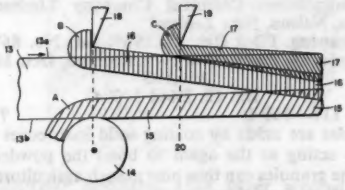
Gerhard Seibert, Erlenbach, and Klaus Gerlach, Obernau, Germany, assignors to Glanzstoff AG, Wuppertal, Germany

Filed July 14, 1970, Ser. No. 54,787

Claims priority, application Germany, July 16, 1969, P 19 36 073.7

Int. Cl. D06m *3/00;* B44d *1/16*

U.S. Cl. 117—63 17 Claims




Production of an imitation or artificial leather by impregnation of a non-woven fibrous web in successive or

separate steps with a solvent solution of an elastomer such that increasing concentrations of the elastomer are supplied over the thickness of the web, immediately coagulating the web in a conventional bath after the last solution of the elastomer has been applied and then washing and drying the web to provide a fiber-reinforced microporous elastomeric structure closely resembling natural leather.

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**3,672,944**
**COMPOSITE SHEET**

**Donald F. Thompson, Atglen, George D. Quartermus, Brookhaven, and Thomas M. Quinn, West Chester, Pa., assignors to Avisun Corporation, Philadelphia, Pa.**

**No Drawing. Filed Mar. 25, 1970, Ser. No. 22,694**
**Int. Cl. B32b *27/30***
**U.S. Cl. 117—76 F** **9 Claims**

A composite sheet comprising an oriented thermoplastic base sheet and a primer on at least one side thereof effective in securing water based Saran Overlay Materials to the base sheet, said primer comprising a composition of:

a first component comprising an acrylic interpolymer of from 50 to 60 weight percent of a $C_1$–$C_4$ alkyl methacrylate, from 50 to 40 weight percent of a $C_1$–$C_4$ alkyl acrylate and from 1 to 5 weight percent of an acid selected from the group consisting of methacrylic, acrylic and itaconic acid, the total weight percent of first component not exceeding 100;

a second component comprising a compound selected from the group consisting of an adduct of rosin and an alpha-beta unsaturated dicarboxylic acid said adduct having an acid number between about 115 and about 140 and a melting point between about 110° C. and about 180° C., partial esters of said adduct and a polyhydric alcohol, and combinations of the adduct and partial esters; the first component being present in the range of from 50% to 80% based on the weight of the first and second components, the second component being present in the range of from 50% to 20% based on the weight of first and second components and the total weight percent of the first and second components of the composition not exceeding 100;

a wax containing component selected from the group consisting of paraffin wax, microcrystalline hydrocarbon wax, and a mixture of carnauba wax and stearic acid wherein the weight ratio of wax to acid is from 82:18 to 89:11, the wax containing component being present in an amount in the range of between about ½% and about 15% based upon the combined weight of the interpolymer combined with either the adduct, the partial esters or the combinations of the adduct and the partial esters.

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**3,672,945**
**GRANULES COMPRISING INERT CORES COATED WITH AN ABSORBENT POWDER**

**Geoffrey Gordon Taylor, Nelson, New Zealand, assignor to Fruitgrowers Chemical Company Limited, Port Mapua, Nelson, New Zealand**

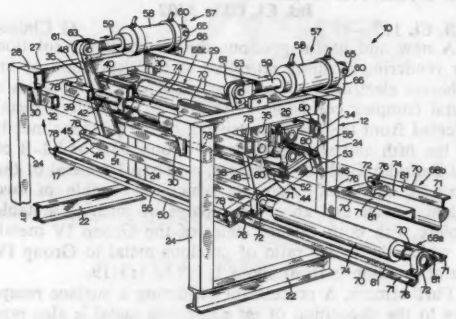
**No Drawing. Filed Oct. 17, 1969, Ser. No. 867,401**
**Claims priority, application New Zealand, Oct. 18, 1968, 154,193**
**Int. Cl. B44d *1/094***
**U.S. Cl. 117—100 B** **7 Claims**

Granules are made by coating solid inert cores with an adhesive acting as the agent to bond the powder to the cores. The granules can thus now absorb agricultural chemicals, such as fungicides, micro-organisms, fertilizers, insecticides and herbicides, and constitute a readily controllable means for the application of such substances to the land or other desired locus.

**3,672,946**
**METHOD AND APPARATUS FOR WRINGING EXCESS LIQUID FROM STEEL STRIP**

**Hans Herman, Ancaster, Ontario, Canada, assignor to The Steel Company of Canada, Limited, Hamilton, Ontario, Canada**

**Filed Mar. 18, 1971, Ser. No. 125,555**
**Int. Cl. B05c *11/02***
**U.S. Cl. 117—102 L** **11 Claims**



Wringing apparatus including two pairs of wringer rolls, one of each pair being secured to a framework, the other of each pair being secured to rocker assembly which is pivoted to the framework and swingable between a first position in which one pair of wringer rolls is closed and the other is open, and a second position in which the other pair of wringer rolls is closed and the first pair is open. Each wringer roll is mounted on a roll frame which is easily de-mounted from the framework for roll replacement when the pair to which it belongs is open. The pairs of wringer rolls are closed alternately on moving steep strip emerging from a liquid bath, each pair remaining closed until its rolls begin to wear.

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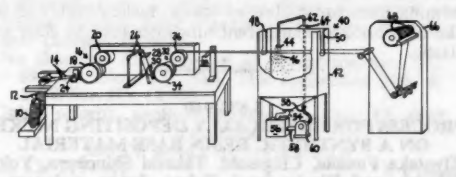
**3,672,947**
**METHOD FOR TEXTURIZING YARNS**

**Paul Luscher and Ben A. Hudson, Shelby, and Billie W. Childers, Forest City, N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Oct. 29, 1969, Ser. No. 872,056**
**Int. Cl. B44d *1/08***
**U.S. Cl. 117—104** **5 Claims**



A texturized, binder-containing yarn produced by applying binder material to a texturized yarn through a jet spray nozzle.

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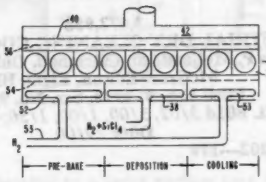
**ERRATUM**

For Class 117—106 R see:
Patent No. 3,673,006

3,672,948
## METHOD FOR DIFFUSION LIMITED MASS TRANSPORT

Robert A. Foehring, Williston, Richard R. Garnache, South Burlington, and Donald M. Kenney, Shelburne, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 2, 1970, Ser. No. 345
Int. Cl. C23c *11/00, 13/00*
U.S. Cl. 117—106 R 4 Claims




Method and apparatus for continuously carrying out mass transfer reactions in a reaction chamber utilizing laminar flow to provide diffusion limited transport and to provide isolation between process steps. There is provided a gaseous phase material inlet filter tube to introduce gaseous phase material in laminar flow within a reaction zone and an exhaust pressure baffle to maintain laminar flow throughout the reaction zone. Substrates may be continuously passed through a reaction zone to provide an inline system.

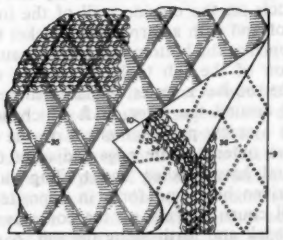
## ERRATA

For Classes 117—115 to 117—219 see:
Patent Nos. 3,672,974 thru 3,672,992

3,672,949
## ADHESIVELY LAMINATED CREPED TISSUE PRODUCT

Stirling Robert Brown, Oxnard, Calif., assignor to International Paper Company, New York, N.Y.

Filed Jan. 12, 1970, Ser. No. 2,134
Int. Cl. B32b *3/28*
U.S. Cl. 161—129 8 Claims

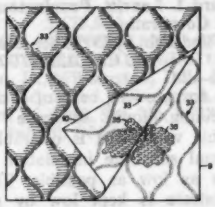


A laminated tissue product as for paper toweling is formed from at least two creped tissue webs bonded in superposed relation by adhesive disposed in patterned lines delineating substantial unbonded regions. Each of the webs is embossed to produce raised portions extending from one surface thereof, and the raised portions of one web oppose respective raised portions of the other web. The raised portions are embossed in patterns assuring opposed relation of the respective raised portions and precluding any substantial nesting of the webs irrespective of the relative lateral disposition of the webs. The webs are joined under different respective tensions so that, upon relaxing, the webs are in different conditions of stress, and one web is of greater area than the other.

3,672,950
## ADHESIVELY LAMINATED CELLULOSIC PRODUCT

James A. Murphy and Stirling Robert Brown, Oxnard, Calif., assignors to International Paper Company, New York, N.Y.

Filed Jan. 12, 1970, Ser. No. 2,135
Int. Cl. B32b *3/28*
U.S. Cl. 161—129 8 Claims



A laminated tissue product is formed from webs bonded in superposed relation employing patterned lines of bonding delineating substantial unbonded regions. The webs are maintained out of intimate contact over substantial portions of these unbonded regions to provide a quilted or cushioned effect. This may be achieved by embossing a number of protuberances on at least one web to face the other and keep the webs apart. Alternatively, or in addition, the webs may be joined under different respective tensions so that, upon relaxing, one web is of greater area than the other.

3,672,951
## ROOFING STRUCTURE AND METHOD

Eugene R. Moore, Marlin G. Bussey, and Hal G. Parish, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

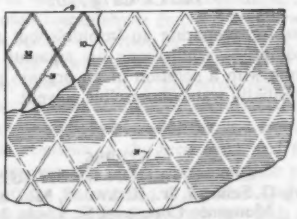
Filed Mar. 17, 1970, Ser. No. 20,317
Int. Cl. B32b *5/18, 11/00;* E04d *5/02*
U.S. Cl. 161—160 2 Claims

Improved plastic foam insulated roof structures are prepared employing a generally constant composition copolymer of styrene and maleic anhydride containing from 15 to 35 weight percent maleic anhydride, the polymer having a solution viscosity of from about 3 to 12 centipoise (10 percent solution of the polymer in methylethylketone at 25° C.).

3,672,952
## ADHESIVELY LAMINATED KRAFT PAPER PRODUCT

Stirling Robert Brown, Oxnard, Calif., and Charles A. Lee, Knoxville, Tenn., assignors to International Paper Company, New York, N.Y.

Filed Jan. 12, 1970, Ser. No. 2,000
Int. Cl. B32b *3/00*
U.S. Cl. 161—146 6 Claims



An adhesively laminated kraft paper product of improved resistance to rupture is formed from at least two superposed kraft paper webs bonded one to the other with an adhesive disposed between said webs in accordance with a selected pattern of lines. The webs are bonded together

in limited regions separated by substantial unbonded regions. Each web is in a different condition of stress in a common direction in the plane of the product.

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3,672,953

## PROCESS FOR GROWING CELLS OF A MICROORGANISM ON A CARBON-CONTAINING LIQUID SUBSTRATE

Vernon F. Coty, Trenton, Israel J. Heilweil, Princeton, and Richard I. Leavitt, Pennington, N.J., assignors to Mobil Oil Corporation

Filed Feb. 9, 1970, Ser. No. 10,172
Int. Cl. C12b *1/00*
U.S. Cl. 195—28 10 Claims

A process for growing cells of a microorganism on a carbon-containing liquid substrate which is partially water-insoluble wherein it is desirable that the amount of the residual substrate in relation to the amount of the cells be as low as possible. The amount of the residual substrate is kept low by maintaining a low concentration of the substrate in the culture medium during growth of the cells. The latter is accomplished by introducing liquid substrate into the culture medium in response to the presence on the surface of the culture medium of a layer of foam of a predetermined height. An antifoaming agent is also employed.

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3,672,954

## PROCESS FOR PREPARING DEPROTENIZED BLOOD EXTRACTS HAVING A HEALING ACTION AND PRODUCT OBTAINED THEREBY

Leonida Grippa, Nettuno, Italy, assignor to Istituto Nazionale Chimico Biologico S.r.l., Rome, Italy

Filed Aug. 20, 1969, Ser. No. 851,593
Claims priority, application Italy, Nov. 2, 1968, 40,904/68
Int. Cl. C07g *7/00*
U.S. Cl. 195—29 6 Claims

A process for preparing deproteinized blood extracts having a healing action which comprises the sequential steps of subjecting, after filtration, hemolyzed and defibrinated blood of animals just slaughtered, to enzymatic hydrolysis, deproteinizing the hydrolysate obtained by heating followed by an immediate cooling and then filtering, and after concentration or lyophilization of the filtrate, deproteinizing further the product with alcohol, removing the lipids therefrom in an organic solvent, purifying, removing histamine therefrom and drying under vacuum the extract obtained.

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3,672,955

## PREPARATION OF AN INSOLUBLE ACTIVE ENZYME

William L. Stanley, Richmond, Calif., assignor to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed May 20, 1970, Ser. No. 39,860
Int. Cl. C07g *7/02*
U.S. Cl. 195—68 5 Claims

Process for preparing an insoluble but active enzyme which comprises emulsifying an aqueous dispersion of the enzyme with a solution of an organic polyisocyanate in an essentially water-immiscible solvent.

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3,672,956

## GERMINATION OF SPORES

Lewis G. Scharpf, Jr., Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Jan. 30, 1970, Ser. No. 7,264
Int. Cl. C12b *1/00*
U.S. Cl. 195—96 17 Claims

This invention relates to methods and compositions for germinating spores of the Bacillus or Clostridium genera utilizing lipases.

3,672,957

## GERMINATION OF SPORES

Lewis G. Scharpf, Jr., Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Jan. 30, 1970, Ser. No. 7,265
Int. Cl. C12b *1/00*
U.S. Cl. 195—96 8 Claims

This invention relates to methods and compositions for germinating spores of the Bacillus or Clostridium genera utilizing amylases.

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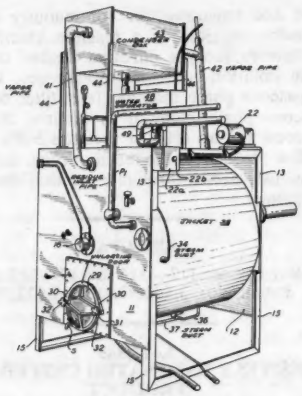
3,672,958

## INDUSTRIAL DRY CLEANING COOKER-STILL

Albanis P. McCandlish, Cincinnati, Ohio, assignor to McGraw-Edison, Elgin, Ill.

Filed Feb. 9, 1970, Ser. No. 9,698
Int. Cl. B01d *3/02, 3/00, 1/00, 1/30;* B01f *11/60;* D06f *29/00*
U.S. Cl. 202—170 2 Claims



An industrial dry cleaning cooker-still for salvaging solvent such as perchlorethylene from oil residues comprises a cylindrical tub mounted horizontally and provided with heating ducts on the outside wall of the lower half portion thereof and with a surrounding jacket to form an air chamber open at the bottom and top for causing the upper half portion of the tub to be heated by convection. A rotor in the tub has a series of blades successively spaced along and around the rotor shaft which are set oblique to provide a screw propeller effect on the contents. The blades have outer arcuate edges adjacent to the wall of the tub and have leading and trailing cutter fins. The rotor is driven back and forth in opposite directions so that it will churn and cut up the contents while shifting the same back and forth along the tub. A scouring powder is added to the oil residue to keep the walls of the tub clean of encrustation. Upon driving the rotor in one direction only the contents are propelled out an unloading door.

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3,672,959

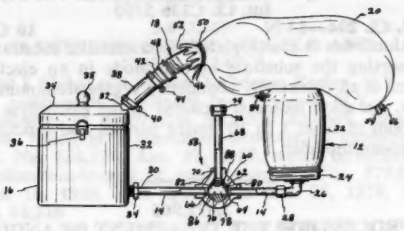
## PORTABLE DISTILLERY

Harold C. Sweet, Fenton, Mich., assignor of a fractional part interest to Merton E. Williams, Grand Rapids, Ohio

Filed Dec. 12, 1969, Ser. No. 884,516
Int. Cl. B01d *3/42*
U.S. Cl. 202—181 2 Claims

A distillery for production of fresh water, including a sealed reservoir and a heated boiler chamber with a conduit communicating between the bottom of the reservoir

and a low point on the boiler chamber to deliver water thereto. A second conduit delivers vapor from the top



of the boiler chamber to a large surface area detachable plastic bag for condensing the vapor.

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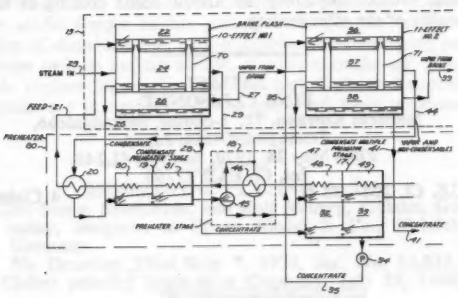
**3,672,960**
**MULTIPLE EFFECT DISTILLATION SYSTEMS**
**David D. Kays, Claremont, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.**
**Filed Feb. 10, 1970, Ser. No. 10,232**
**Int. Cl. B01d *3/00, 3/02***
**U.S. Cl. 203—11** **4 Claims**



According to the multiple effect evaporation process disclosed herein, a feed liquor is sequentially operated on in a plurality of serially arranged evaporator effects. Hot vapor directed into one effect transfers heat to liquor in the effect to vaporize part of the liquor and to enrich the remainder of the liquor to form a concentrate. The hot vapor condenses on a heat transfer surface so that some of the hot vapor forms a condensate. The enriched liquor (concentrate) and the vapor from the liquor are forwarded to the next effect in such a manner that the vapor from the liquor transfers heat to the enriched liquor to vaporize part of the enriched liquor, thereby enriching the remainder of the enriched liquor. More vapor is condensed in each effect. The feed liquor is preheated by spontaneously vaporizing some of the enriched liquor from each effect to cool the remainder of the enriched liquor, and by transferring heat from the vapor from the enriched liquor to the feed liquor, thereby heating the feed liquor. The feed liquor is also preheated by condensing hot vapor from each effect on heat exchange tubes containing the effect of feed liquor. The feed liquor is also heated by spontaneously vaporizing a portion of the condensed vapor in the presence of heat exchange tubes carrying feed liquor to heat the feed liquor. Also, as concentrate is forwarded to each effect, it is spontaneously vaporized to cool some of the concentrate thereby establishing a temperature differential between the vapors from the previous effect and the cooled concentrate to effectuate heat transfer between the hot vapors and the cooled concentrate.

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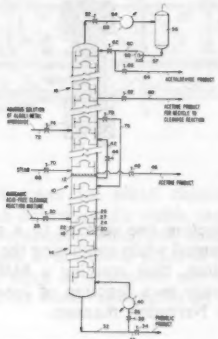
**3,672,961**
**FRACTIONATION OF INORGANIC ACID-FREE, CLEAVAGE REACTION MIXTURE**
**Joseph R. Nixon, Jr., Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.**
**Filed Oct. 16, 1969, Ser. No. 867,011**
**Int. Cl. B01d *3/34***
**U.S. Cl. 203—37** **6 Claims**



Disclosed is a continuous process for fractionating in a single, multiple plate distillation column an inorganic acid-mixture resulting from the cleavage reaction of hydroperoxide material selected from the group consisting of cumene hydroperoxide, cymene hydroperoxides, β-isopropylnaphthalene hydroperoxide, m- and p-diisopropylbenzene mono- and dihydroperoxides. The column has a lower fractional distillation zone and an upper fractional condensation zone. In the process the mixture is introduced into the lower zone and separated therein by fractional distillation into a liquid phenolic product and a vaporous acetaldehyde-acetone fraction. The vaporous fraction is introduced into the upper zone and separated by condensation into a liquid acetone fraction and a vaporous acetaldehyde fraction. The liquid acetone fraction is withdrawn from the bottom of the upper zone as acetone product, while the vaporous acetaldehyde fraction is withdrawn from the top of the upper zone and condensed. A portion of the condensed acetaldehyde fraction is returned to the upper zone as reflux. A portion of the liquid at any stage of the upper zone is withdrawn and returned to the lower zone as reflux. However, in a preferred embodiment of the process, an aqueous solution of alkali metal hydroxide material, at a rate sufficient to establish and maintain alkaline the liquid contents of the feed stage and any lower stages of the upper zone, as well as the acetone product, is introduced into the upper zone at the feed stage or preferably at a stage above the feed stage at which the liquid water content is high enough to maintain the alkali metal hydroxide material in solution. In such embodiment the lower zone reflux liquid is withdrawn from the upper zone at a stage above the stage at which the aqueous alkali metal hydroxide solution is introduced.

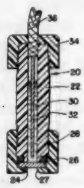
3,672,962

## ION-SENSITIVE ELECTRODE AND METHOD OF MAKING AND USING SAME

Martin S. Frant and James W. Ross, Newton, Mass., assignors to Orion Research Incorporated, Cambridge, Mass.

Continuation of application Ser. No. 511,751, Dec. 6, 1965. This application Mar. 17, 1971, Ser. No. 125,390
Int. Cl. G01n 27/46
U.S. Cl. 204—1 T 9 Claims

A potentiometric type electrode for detecting sulfide ion activity in solution, and methods of making and using same. The electrode has, as its ion-sensitive element, a membrane of substantially imporous, high purity silver sulfide substantially free of metallic silver. The membrane is preferably made by compressing silver sulfide powder to form an imporous sheet or pellet. The membrane is




used by contacting one surface to a reference electrode at a fixed potential while contacting the other surface with the test solution, thus creating a half-cell across which voltage will vary as a function of ion-activity in the test solution in a Nernstian manner.

3,672,963

## PROCESS OF COATING METALS WITH MERCURY OR MERCURY AMALGAMS

Vito A. De Palma, Tonawanda, N.Y., assignor to Cornell Aeronautical Laboratory, Inc., Buffalo, N.Y.

No Drawing. Filed May 15, 1970, Ser. No. 37,892
Int. Cl. C22d 1/26; C23b 1/00, 5/00
U.S. Cl. 204—14 N 6 Claims

A process for wetting metals wherein, the metal to be coated is electropolished in a substantially alchol bath and is brought in proximity with a wetting agent; the potential is reversed, causing the wetting agent to adhere to the metal to be coated.

3,672,964

## PLATING ON ALUMINUM, MAGNESIUM OR ZINC

Harold Edward Bellis, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Mar. 17, 1971, Ser. No. 125,334
Int. Cl. C23b 1/00; C23f 17/00
U.S. Cl. 204—33 10 Claims

A process for plating aluminum, magnesium or zinc with an adherent nickel coating is provided. The process comprises contacting the surface of the metal to be treated with an aqueous solution of hydrofluoric acid or a material which releases hydrofluoric acid, such as ammonium bifluoride, and a soluble, catalytic metal salt of a metal such as nickel, iron or silver, and subsequently applying a nickel coating which is stress-free to said treated metal surface, preferably 0.2 to 1 mil in thickness, from an amine borane reductive plating solution maintained at a pH of about 6 to 7 and containing an organic monovalent or divalent sulfur compound. A thicker nickel overcoating can be subsequently applied to the nickel coating using either hypophosphite or borohydride reductive plating baths, or electroplated nickel. Further, adhesion and wear resistance can be upgraded by post heat-treating.

3,672,965

## ELECTROPLATING OF ALUMINUM

William H. Harwood, Lawton, Okla., assignor to Continental Oil Company, Ponca City, Okla.

No Drawing. Filed June 29, 1970, Ser. No. 50,883
Int. Cl. C23b 5/00
U.S. Cl. 204—14 N 10 Claims

Aluminum is electroplated upon metallic substrates by immersing the substrate as a cathode in an electrolyte which is an electrically conductive organoaluminum complex. An alkyl halide is included in the electrolyte in an amount of from 1 to 10 weight percent and functions as a deposit modifier.

3,672,966

## PROCESS FOR THE TREATMENT OF ANODIC OXIDIZED ALUMINUM SURFACES

Roland Geisler, Dusseldorf-Holthausen, and Hans Gunther Germscheid, Hosel, Germany, assignors to Henkel & Cie GmbH, Dusseldorf, Germany

No Drawing. Filed July 8, 1970, Ser. No. 53,318
Claims priority, application Germany, July 26, 1969, P 16 38 039.3
Int. Cl. C23f 17/00
U.S. Cl. 204—35 N 5 Claims

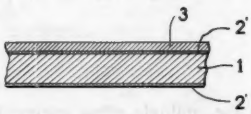
An improvement in the treatment of anodic oxidized aluminum surfaces with subsequent sealing with hot water or steam. The improvement comprises either an intermediate treatment or a combined treatment with the sealing of the aluminum surfaces at from 15° C. to 95° C. with a solution of acrylic acid and/or a polymer of acrylic acid, methacrylic acid or maleic acid having a specific viscosity of up to $\eta = 0.75$ cp. in a 0.7% solution in 2 N NaOH at 20° C. The treatment prevents the formation of sealing films without impairing the anodic oxide coating or the quality of the after-sealing.

3,672,967

## FINE CLOISONNÉ

Sadaichi Kuwano, 72, 1-chome, Saikudanicho, Tennojiku, Osaka, Japan

Filed May 28, 1970, Ser. No. 41,245
Int. Cl. C23f 17/00
U.S. Cl. 204—38 C 4 Claims




Producing fine cloisonné jewelries for instance high-class lapel pins from a base of copper or brass by plating special silver alloy on the base before coating with cloisonné.

3,672,968

## BATH FOR ELECTROLYTIC DEPOSITION OF MAGNETIC FILMS

Philip C. Baldwin, El Segundo, Calif., assignor to Burton Electrochemical Co., Inc., Los Angeles, Calif.

Filed Feb. 2, 1970, Ser. No. 7,791
Int. Cl. C23b 5/32
U.S. Cl. 204—43 6 Claims

A bath for electrolytic deposition of magnetic films of relatively high, controlled coercivity. The bath comprises an ammoniacal solution of cobalt or cobalt and nickel salts, tungsten as tungstic acid or sodium tungstate and sodium hypophosphite. The concentration of sodium hypophosphite in the bath determines the coercivity of the resultant magnetic films, and permits control thereof over a wide range of values. Rochelle salt or other citrate

or tartrate may be used in the bath to aid complexing of the cobalt, and formaldehyde may be added to inhibit electroless deposition from the bath.

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3,672,969
## ELECTRODEPOSITION OF GOLD AND GOLD ALLOYS

Fred I. Nobel and Barnet D. Ostrow, Roslyn, N.Y., assignors to Lea-Ronal, Inc., Freeport, N.Y.

Continuation of application Ser. No. 830,547, June 4, 1969, which is a continuation-in-part of application Ser. No. 634,134, Apr. 27, 1967, which in turn is a continuation-in-part of application Ser. No. 579,821, Sept. 16, 1966. This application Oct. 26, 1970, Ser. No. 84,228

Int. Cl. C23b *5/42, 5/28, 5/46*

U.S. Cl. 204—43 21 Claims

Organo-phosphorus compounds and their water soluble salts are incorporated into aqueous soluble cyanide gold or gold alloy plating baths.

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3,672,970
## ELECTROLYTIC CODEPOSITION OF COPPER WITH FINE PARTICLES

Thaddeus W. Tomaszewski, Dearborn, Mich., assignor to The Udylite Corporation, Warren, Mich.

No Drawing. Filed June 19, 1969, Ser. No. 834,868

Int. Cl. C23b *5/48, 13/00*

U.S. Cl. 204—52 R 8 Claims

Fine particles of non-conducting materials do not codeposit readily from aqueous acidic copper plating baths, unless there is present in the bath monovalent cations such as thallium, ammonium and the alkali metal cations. These monovalent cations are especially effective in acidic copper sulfate plating baths for the codeposition of dispersed fine, bath-insoluble, non-conducting particles such as barium sulfate, zirconium oxide, etc. Possible engineering applications for such 2-phase composite plates are in anti-seizing and improved wear resistance.

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3,672,971
## BRIGHT-ZINC PLATING BATH

Gerd Senge, Brackwede, and Rolf Sieburg, Eickum, Germany, assignors to Firma Riedel & Co., Bielefeld, Germany

No Drawing. Filed July 7, 1970, Ser. No. 53,038

Claims priority, application Germany, July 15, 1969, P 19 35 821.5

Int. Cl. C23b *5/10*

U.S. Cl. 204—55 R 6 Claims

A bright-zinc plating bath in which the primary brightening agent consists of a reaction mixture of polyamines, salts of the metals of Groups V and VI of the Periodic Table and sulfur-releasing organic compounds. The sulfur-splitting compounds are preferably aliphatic aromatic and heterocyclic compounds containing sulfur and include mercaptane, thiocompounds and the like.

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3,672,972
## METHOD FOR FORMING ANODIC OXIDE COATINGS HAVING IMPROVED ADHESIVE PROPERTIES

Geoffrey A. Dorsey, Jr., Danville, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

No Drawing. Continuation-in-part of application Ser. No. 707,962, Feb. 26, 1968. This application Mar. 23, 1970, Ser. No. 22,022

Int. Cl. C23b *9/02*

U.S. Cl. 204—58 1 Claim

A method for improving the adhesive bond between an aluminum surface and other materials comprising pretreating the aluminum surface by anodizing in an acidic electrolyte in such as manner that an initially formed anodic oxide layer dissolves at about the same rate at which it is being formed and pseudoboehmite is formed in the oxide coating that remains on the aluminum surface.

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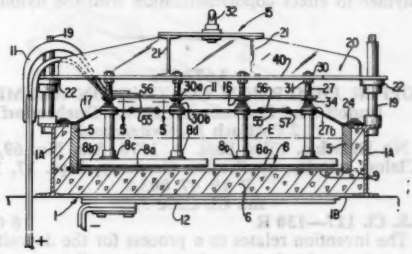
3,672,973
## CELL COVER WITH WEAKENED AREAS TO RELIEVE EXPLOSIONS

Vittorio De Nora, Nassau, Bahama Islands, and Richard E. Loftfield, Chardon, Ohio, assignors to Oronzio De Nora Impianti Elettrochimici S.p.A., Milan, Italy

Filed Nov. 28, 1969, Ser. No. 880,840

Int. Cl. C01d *1/08;* C22d *1/04*

U.S. Cl. 204—99 8 Claims



Describes a cell cover for alkali chlorine cells, primarily for use with dimensionally stable anodes, but also useful with graphite anodes, which cell cover is provided with weakened areas, in accessible place in the cell cover, through which the force of explosions can be vented and which weakened areas when ruptured by an explosion can be easily repaired.

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3,672,974
## METHOD OF IMPREGNATING AND COATING STRANDED BODIES

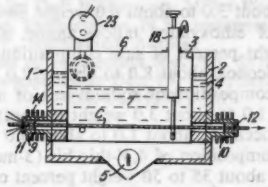
Roy Tomlinson, Middleton, England, assignor to Connollys (Blackley) Limited, Manchester, England

Filed Feb. 3, 1970, Ser. No. 8,298

Claims priority, application Great Britain, Feb. 6, 1969, 6,450/69

Int. Cl. B05c *3/12;* B44d *1/02*

U.S. Cl. 117—115 9 Claims



In order to coat and fill the interstices between the elements of an elongated flexible body, for instance a multiconductor cable core, formed by stranding or bunching a plurality of the elements together, the body is impregnated and coated with a filling material by passing it into a bath of filling material, in a liquid state, through an inlet die, through the liquid in the bath, and then out of the bath through an outlet die. The dies are wholly situated below the level of the liquid and are maintained at a temperature such that there is no substantial leakage of the liquid from the bath therethrough while the body is passing continuously through the bath. Preferably the dies are each mounted at the free end of a metal tube projecting from the wall of the bath and are maintained at the said temperature by means of external cooling fins on the tubes.

3,672,975

## COPOLYMERIZATION OF POLYACRYLIC ACID WITHIN NYLON STRUCTURES

Gilbert N. Arons, Newton Highlands, Mass., assignor to the United States of America as represented by the Secretary of the Army

No Drawing. Filed June 9, 1970, Ser. No. 44,873
Int. Cl. B44d *5/12*
U.S. Cl. 117—118 8 Claims

Copolymerization of polyacrylic acid within a nylon structure is accomplished by diffusing an aqueous solution of acrylic acid polymer, having a molecular weight range of from 2000 to 20,000 and at a pH of from 1.5 to 3.5, under elevated temperatures into the nylon structure, drying, and thereafter heat curing said diffused acrylic acid polymer to effect copolymerization with the nylon.

3,672,976

## COPPER IMMERSION COATING ON ALUMINUM

Rudolf Paul Kallenbach CH8600 Duebendorf, 2 Postfach 15, Switzerland

No Drawing. Filed Sept. 4, 1970, Ser. No. 69,964
Claims priority, application Germany, Sept. 17, 1969, P 19 47 003.2
Int. Cl. C23c *3/00*
U.S. Cl. 117—130 R 8 Claims

The invention relates to a process for the deposition of a metal on aluminum and aluminum alloys by electrochemical displacement without the use of an external current, a method commonly termed immersion coating. It particularly relates to the deposition of copper and to novel compositions and baths for this purpose.

3,672,977

## PRODUCTION OF POLYESTERS

Kimon Constantine Dardoufas, Richmond, Va., assignor to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Oct. 26, 1970, Ser. No. 84,168
Int. Cl. C08j *1/44;* D06m *13/00*
U.S. Cl. 117—138.8 F 1 Claim

An improved multifilament polyethylene terephthalate yarn having a lubricating protective film applied thereon of from about 0.3 to about 0.6 weight percent based on the weight of the yarn of a liquid composition consisting essentially of about 10 to about 20 weight percent of said composition of each hexadecyl stearate and refined coconut oil, about 3.0 to about 6.0 weight percent of said composition of ethoxylated tallow amine, about 10 to about 20 weight percent of said composition of ethoxylated lauryl alcohol, about 8.0 to about 12.0 weight percent of said composition of sodium salt of alkylarylsulfonate, about 1.0 to about 3.0 weight percent of dinonylsodium-sulfosuccinate, about 1.0 to about 3.0 weight percent of said composition of 4,4'-thio-bis-(3-methyl-6-tert-butylphenol), about 35 to 50 weight percent of said composition of white mineral oil having a boiling point of between 510° F. and 620° F. wherein at least about 0.15 to about 0.30 weight percent is retained on said yarn, and then treating said yarn with from about 0.7 to about 1.2 weight percent on said yarn of a liquid composition selected from the group consisting of (a) about 95 to about 98 weight percent of said composition of triethylene glycol-dipelargonate and about 2 to about 5 weight percent of said composition of 2,2'-methylene-bis-(4-methyl-6-tert nonylphenol), and (b) about 13 to about 25 weight percent of said composition selected from the group consisting of glycerol monoleate and decaglycerol tetraoleate with ethoxylated tall oil fatty acids, about 12 to about 20 weight percent of said composition selected from the group consisting of sulfated glycerol trioleate and ethoxylated alkylamine, and about 55 to about 75 weight percent of said composition of hexadecyl (isocetyl) stearate.

3,672,978

## METHOD OF RENDERING TEXTILE MATERIALS ABSORPTIVE

Rudi Widder, Eppelheim, and Harry Distler and Friedrich Fuchs, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Feb. 17, 1970, Ser. No. 12,127
Claims priority, application Germany, Feb. 22, 1969, P 19 08 966.8
Int. Cl. D06m *13/26*
U.S. Cl. 117—139.5 CQ 5 Claims

Textile materials are rendered absorptive by impregnation with a sulfitobetaine containing an aliphatic hydrocarbon radical of medium chain length.

3,672,979

## METHOD OF PRODUCING A PHTHALOCYANINE PHOTOCONDUCTIVE LAYER

Paul L. Gerace and Nikolaus E. Wolff, Rochester, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

No Drawing. Filed Jan. 2, 1970, Ser. No. 462
Int. Cl. H01c *7/08;* C09k *3/00*
U.S. Cl. 117—201 10 Claims

A novel process for the preparation of a photoconductive layer of an electrophotographic plate which comprises combining phthalocyanine pigment particles and a binder material in a liquid medium and sandmilling and the combination is disclosed.

3,672,980

## METHOD OF RAPIDLY DETECTING CONTAMINATED SEMICONDUCTOR SURFACES

William B. Glendinning, Belford, and Wellington B. Pharo, Neptune, N.J., assignors to the United States of America as represented by the Secretary of the Army

No Drawing. Filed Dec. 1, 1970, Ser. No. 94,150
Int. Cl. B44d *1/18;* C23c *11/00*
U.S. Cl. 117—201 3 Claims

A silicon substrate is rapidly screened for surface contamination by exposing the substrate surface to a chemical vapor environment of nitric oxide, hydrogen fluoride and water at about 27 degrees C. to obtain a transparent surface film of about 50 to 100 angstroms in thickness, and then examining the film for surface uniformity and for the presence of geometric shapes.

3,672,981

## ELECTROTHERMOGRAPHIC DUPLICATING SHEET

Donald D. Sloan, Weston, and Suresh D. Amberkar, Framingham, Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

No Drawing. Filed Oct. 2, 1969, Ser. No. 863,365
Int. Cl. B44d *1/18*
U.S. Cl. 117—201 10 Claims

An electrothermographic duplicating sheet is disclosed. A layer comprising a mixture of an electrostatically chargeable resin and an organic heat-activatable tackifying agent is adhered to a conductive base sheet. When subjected to radiant thermographic heat, both a latent tacky image and latent electrostatic image is formed.

3,672,982

## CONDUCTIVE BASE SHEET FOR ELECTROPHOTOGRAPHIC REPRODUCTION SHEET

Frederick W. Travers, Wellesley, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

No Drawing. Filed July 29, 1970, Ser. No. 59,035
Int. Cl. G03g *5/00*
U.S. Cl. 117—201 15 Claims

A conductive base paper sheet for receiving an electrophotographic coating, which sheet has a conductive and/or

holdout layer containing a water soluble, conductive, ionizable resin, such as a quaternary ammonium salt polymer, and/or other synthetic resin which is normally tacky, and a water soluble inorganic salt of a strong inorganic mineral acid or a water soluble salt of acetic acid, preferably sodium, potassium and ammonium salts of phosphoric and hydrochloric acid, to detackify the otherwise tacky conductive or other synthetic resin.

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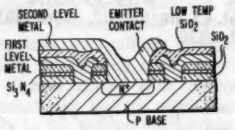
3,672,983

## PROCESS FOR MAKING METAL CONTACTS TO HIGH SPEED TRANSISTORS AND PRODUCT FORMED THEREBY

David De Witt, Poughkeepsie, Vir A. Dhaka, Hopewell Junction, and Avtar S. Oberai, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 9, 1970, Ser. No. 1,673
Int. Cl. H01l 7/34
U.S. Cl. 117—212 2 Claims




In a semiconductor device, the emitter and base metal contact stripes are at different levels and are separated by silicon dioxide and silicon nitride. By using such a silicon dioxide separatory layer in combination with an initial silicon nitride coating over the emitter and base regions in the semiconductor substrate, the silicon nitride coating being etched during processing, a high speed transistor having a very small emitter-base contact spacing, and a small emitter stripe width is obtained.

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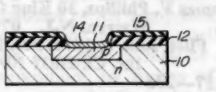
3,672,984

## METHOD OF FORMING THE ELECTRODE OF A SEMICONDUCTOR DEVICE

Kogo Sato, Kokubunji, Hiroshi Kato, Tokyo, and Shinji Ohnishi, Kokubunji, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 25, 1970, Ser. No. 14,116
Claims priority, application Japan, Mar. 12, 1969, 44/18,331
Int. Cl. H01l 1/14
U.S. Cl. 117—212 7 Claims



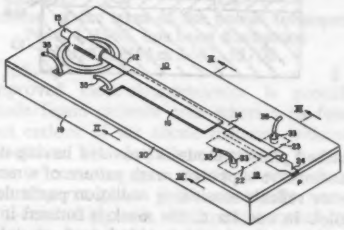

In forming an electrode in a semiconductor device, an aluminium layer is thinly deposited on the whole surface of a film of semiconductor oxide such as silicon oxide covering a major surface of a semiconductor substrate and on a portion of the major surface exposed in a hole formed in the film, the combination thus obtained is heated so that the portion of the aluminium layer deposited in the hole is alloyed with the semiconductor and so that the portion of the aluminium layer on the film is oxidized by the reaction with the semiconductor oxide, then an electrode metal is deposited on the alloy region thus obtained. The layer of the oxidized aluminium, that is, alumina is used as a passivation film.

3,672,985

## CONDUCTOR ELEMENTS SPACED FROM MICROELECTRONIC COMPONENT SURFACE AND METHODS OF MAKING THE SAME

Harvey C. Nathanson and Robert A. Wickstrom, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Application May 31, 1968, Ser. No. 733,581, which is a division of application Ser. No. 465,090, June 18, 1965, now Patent No. 3,413,573. Divided and this application May 5, 1970, Ser. No. 34,807
Int. Cl. B44d 1/14
U.S. Cl. 117—212 9 Claims



A microelectronic component is provided with a conductive member having one or more extremities affixed to and supported by a substrate, such as an integrated circuit, and an extended portion from an extremity that is, or between two extremities that are, in permanently fixed spaced relation, substantially parallel to the substrate without intervening support material. The conductive member may be used for various purposes such as for the vibratory member of a resonant gate transistor or a conductive bridge crossing over elements of an integrated circuit. The conductive member may be formed by a method including use of a spacer layer in the position of the extended portion for deposition thereof followed by removal of the spacer layer.

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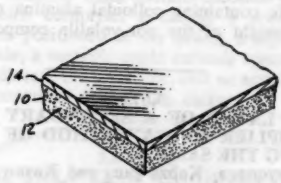
3,672,986

## METALLIZATION OF INSULATING SUBSTRATES

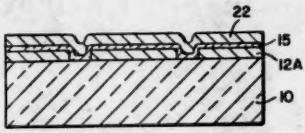
Frederick W. Schneble, Jr., Oyster Bay, John F. McCormack, Roslyn Heights, Rudolph J. Zeblisky, Hauppague, John Duff Williamson, Miller Place, and Joseph Polichette, Farmingdale, N.Y., assignors to Day Company, N.V., Netherlands Antilles

Continuation of application Ser. No. 561,123, June 28, 1966. This application Dec. 19, 1969, Ser. No. 882,782
Int. Cl. H05k 3/06
U.S. Cl. 117—212 8 Claims




A blank for the production of metallized articles is provided, which comprises an insulating base which is catalytic throughout its interior to the reception of electroless metal, and a surface on said base having super-imposed thereon and adhered thereto a unitary thin film of metal. In addition, methods for metallizing plastics and forming plated through hole printed circuit boards are also provided.

3,672,987
**MASKED PHOTOCATHODE AND METHOD OF MAKING SAME**
Terence W. O'Keeffe, Pittsburgh, and Jerome R. Morris, Trafford, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Original application Dec. 18, 1968, Ser. No. 784,801. Divided and this application Dec. 23, 1969, Ser. No. 887,707
Int. Cl. H01j *31/06*
U.S. Cl. 117—212 2 Claims




A masked photocathode is provided having on a radiation transmissive support a mask pattern of a material that absorbs or reflects sensitizing radiation particularly in the ultraviolet. In one form, the mask is formed in a process that includes at least partial oxidation of a metal layer pattern. Alternatively, a mask pattern that blocks all radiation with high reflectivity may be formed by employing a metal with a subsequent insulating layer, such as of an oxide of the metal or a separately deposited insulator, for protection from the photocathode. In another form the photoemissive layer may be deposited directly on the transmissive support and have on its surface a pattern of organic material to provide the mask for electrons on the target side of the cathode as well as to prevent any radiation reflected from the target from impinging on areas from which photoemission is not desired.

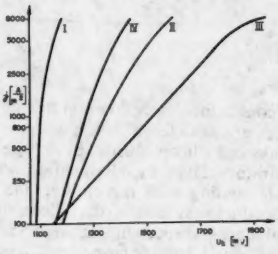
3,672,988
**METHOD OF MANUFACTURING BASES FOR ELECTROSTATIC RECORDING MATERIAL OR ELECTROPHOTOGRAPHIC MATERIAL**
Yasuo Tamai and Satoru Honjo, Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Nakanuma, Minami-Ashigara Machi Ashigara-Kamigun, Kanagawa, Japan
No Drawing. Filed Feb. 24, 1970, Ser. No. 13,807
Claims priority, application Japan, Feb. 25, 1969, 44/64,082
Int. Cl. G03g *5/08, 7/00*
U.S. Cl. 117—215 13 Claims

A method for manufacturing a base for an electrostatic recording material or electrophotographic sensitive material, which comprises forming an electroconductive layer on at least one surface of a base consisting of a non-metallic substance by treating said surface with a treating mixture containing colloidal alumina of more than 70% by weight of the non-volatile components of the mixture.

3,672,989
**POROUS LAYER OF A SECONDARY ELECTRON MULTIPLIER AND A METHOD OF MANUFACTURING THE SAME**
Ryuya Toyonaga, Kohza-gun, and Kazuo Sato, Tokyo, Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan
No Drawing. Filed July 29, 1969, Ser. No. 845,882
Claims priority, application Japan, Aug. 3, 1968, 43/54,634
Int. Cl. C23c *13/00*
U.S. Cl. 117—224 2 Claims

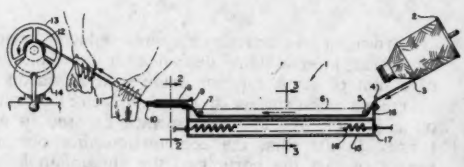
As a material for a porous layer of a secondary electron multiplier used for instance in a secondary electron conductive type camera tube or a secondary electron multiplier tube, it is desirable to use a metal oxide such as magnesium oxide, aluminum oxide or the like, which is chemically and physically stable. However, in general, a metal oxide has considerably high evaporation temperature so that vacuum evaporation under low vacuum of such oxide is difficult. In the method of the invention by utilizing an eutectic phenomenon of such metal oxide with secondary electron emissive substances having comparatively low evaporation temperature and being a nature of easiness of deposition under low vacuum, it is easily achieved to evaporate such a metal oxide under low vacuum. Thus a superior porous layer for use for instance in a secondary electron multiplier can be formed, which does not lose the porous property in a succeeding heat treatment during the process of manufacturing a multiplier tube.

3,672,990
**PRODUCTION OF ELECTRODES**
Fritz Beck, Ludwigshafen, and Gotthard Csizi, Bad Duerkheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
Filed Mar. 25, 1970, Ser. No. 22,428
Claims priority, application Germany, Mar. 28, 1969, P 19 15 951.4
Int. Cl. B01k *3/02, 3/06;* H01b *1/08*
U.S. Cl. 117—230 7 Claims




Layers of an oxide mixture of at least one platinum metal and oxides of the elements silicon, tin or germanium are applied to a core of an anodically stable material for the production of activated electrodes. For this purpose, silicon, tin or germanium or a compound thereof with the platinum metal or a compound thereof is converted into oxidic compounds and these are fixed onto the surface of the anodically stable material by thermal treatment.

3,672,991
**MAGNETIZED RECORDER THREAD**
James V. Phillips, 30 King George Road, Warren, N.J. 07060
Filed June 2, 1970, Ser. No. 42,742
Int. Cl. H01f *10/04*
U.S. Cl. 117—235 2 Claims



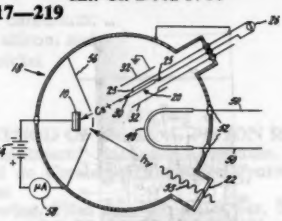
A magnetized recorder thread and method of making same, wherein a textile thread is easily and economically impregnated with a mixture of wax and iron oxide and which can be used only once and then is thrown away if desired.

3,672,992

## METHOD OF FORMING GROUP III–V COMPOUND PHOTOEMITTERS HAVING A HIGH QUANTUM EFFICIENCY AND LONG WAVELENGTH RESPONSE

Donald L. Schaefer, Skaneateles, N.Y., assignor to General Electric Company

Filed July 30, 1969, Ser. No. 846,155
Int. Cl. B44d *1/18*
U.S. Cl. 117—219 8 Claims



A photoemitter having a high quantum efficiency and a low work function for photoemission, i.e. photoelectric threshold, is formed by depositing a 10–100 A. film of a wide bandgap Group III–V compound, e.g. gallium phosphide, atop a 0.5–10 micron thick layer of a second Group III–V compound, e.g. gallium antimonide, having a bandgap matching the desired photoelectric threshold. The film surface then is treated with cesium (or cesium and oxygen) to reduce the surface work function of the composite structure to the desired photoelectric threshold. When the Group III–V layer forming the photoemitter is epitaxially grown atop an oriented substrate of a semiconductive material such as gallium arsenide having a bandgap wider than the bandgap of the overlying layer, the resulting photoemitter is transparent only in a range between the bandgap of the substrate and the bandgap of the overlying layer.

3,672,993

## METHOD AND COMPOSITIONS FOR CLEANING OVENS AND THE LIKE

Harry Ian Mitchell, Rochdale, and Kenneth Tomlinson, Bramhall, England, assignors to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed July 30, 1970, Ser. No. 59,753
Int. Cl. C23g *1/02*
U.S. Cl. 134—3 9 Claims

A method is provided whereby baked on organic deposits from a surface are readily removable wherein an alkali metal bicarbonate is applied to the clean surface and subsequent cleaning after soiling is effected by washing of the surface to remove the soiled coating. Compositions are provided for use in the process which include in addition to the alkali metal bicarbonate, an aqueous vehicle and a surface active agent. Other additives may also be included in the compositions such as suspensing agents, corrosion inhibitors, gelling agents and coloring materials. The process may be carried out by applying the compositions by means of a sponge, brush or cloth, from a spray bottle or by means of an aerosol type pressurized dispenser.

3,672,994

## SODIUM-SULFUR CELL WITH THIRD ELECTRODE

Stephan P. Mitoff, Elnora, N.Y., assignor to General Electric Company

Filed Jan. 4, 1971, Ser. No. 103,521
Int. Cl. H01m *29/00, 35/00*
U.S. Cl. 136—6 3 Claims

A sodium-sulfur cell is described which includes an anodic reaction zone, a cathodic reaction zone, a solid crystalline ion conductive electrolyte therebetween, and a third electrode positioned in the cathodic reaction zone and insulated electrically from a portion of the cathodic reaction zone. One type of third electrode for this cell has a metal mesh adjacent the solid electrolyte. A thin porous insulator is positioned on opposite surface of the metal mesh adjacent the cathodic reaction material. A method of charging a sodium-sulfur cell employing such a third electrode is described also.

3,672,995

## SOLID ELECTROLYTE FOR ELECTRICAL CELLS

William E. Brown, Walnut Creek, and Robert G. Heitz and Charles A. Levine, Concord, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of application Ser. No. 567,587, July 25, 1966. This application May 8, 1969, Ser. No. 823,161
The portion of the term of the patent subsequent to Nov. 4, 1986, has been disclaimed
Int. Cl. H01m *3/02, 35/00*
U.S. Cl. 136—6 5 Claims

An improved electrolyte-separator is provided for liquid anode/liquid cathode cells wherein its function is to conduct cations of the anode material without transmitting electrons. The electrolyte-separator is an impregnated glass or ceramic, open matrix wherein the discontinuous or disperse phase is an essentially non-migrating, cation-conducting salt. Such impregnated matrixes are particularly useful in batteries having molten alkali metal anodes and alkali metal sulfur mixtures for cathodes.

3,672,996

## RECHARGEABLE ALKALINE GALVANIC CELL AND ELECTROLYTE THEREFOR

Demetrios V. Louzos, Rocky River, Ohio, assignor to Union Carbide Corporation

Application June 20, 1968, Ser. No. 747,060, which is a Continuation-in-part of application Ser. No. 393,994, Sept. 2, 1964. Divided and this application Sept. 24, 1969, Ser. No. 863,747
Int. Cl. H01m *35/00*
U.S. Cl. 136—6 14 Claims

A rechargeable alkaline galvanic cell having a zincate-containing electrolyte which comprises an aqueous alkaline medium containing dissolved zincate ions in an amount such that the electrolyte contains at least about 2 weight percent zinc and an ion of an amphoteric metal, i.e., a molybdate, arsenate or tungstate.

3,672,997

## SEALED METALLIC OXIDE-INDIUM SECONDARY BATTERY

Elihu C. Jerabek, Delmar, N.Y., assignor to General Electric Company

Filed June 30, 1970, Ser. No. 51,172
Int. Cl. H01m *35/02*
U.S. Cl. 136—20 4 Claims

A sealed metallic oxide-indium secondary battery is disclosed which comprises a casing, a pressed indium powder anode positioned in the casing, a separator adjacent the anode, a metallic oxide cathode spaced from the anode and adjacent the separator, and an aqueous alkaline electrolyte contained within the casing.

3,672,998

## EXTENDED AREA ZINC ANODE HAVING LOW DENSITY FOR USE IN A HIGH RATE ALKALINE GALVANIC CELL

William G. Darland, Jr., Parma, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 738,474, Jan. 20, 1968, which is a continuation-in-part of application Ser. No. 612,645, Jan. 30, 1967. This application Dec. 5, 1969, Ser. No. 882,714
Int. Cl. H01m *41/00*
U.S. Cl. 136—30 16 Claims

For use in a high rate alkaline galvanic cell, an extended area anode compact is provided composed of

elongated forms of zinc such as zinc fibers or wool, in pressure-formed, multipoint physical contact throughout the body of the anode compact. The anode compact may also be formed from fabricated metal such as expanded zinc metal or screen. In forming the anode compact, the zinc fibers, wool or expanded zinc metal is compression molded to a controlled low bulk density of below 2.5 grams per cubic centimeter. To attain reasonably high electrode efficiencies on the order of 70% of theoretical and above at electrical current drains of about 250 amperes per square foot, the anode compact is formed to a low bulk density of from about 1 to 1.75 and preferably from about 1 to 1.50 grams per cubic centimeter. Optimum electrode efficiencies are attained if the bulk density of the anode compact is maintained within the range of from about 1.0 to 1.25 grams per cubic centimeter. Suitable means are provided in the cell employing the anode compact for maintaining its internal temperature at least at a minimum operating temperature required to discharge the cell at high current densities.

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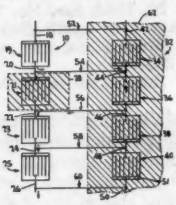
**3,672,999**

## USE OF UNILLUMINATED SOLAR CELLS AS SHUNT DIODES FOR A SOLAR ARRAY

**Anthony J. Barbera, Greenbelt, Md., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration**

**Filed Dec. 19, 1968, Ser. No. 785,078**
**Int. Cl. H01l *15/02***
**U.S. Cl. 136—89** **9 Claims**



In a plurality of solar cells connected in a number of series paths to form both shaded and illuminated solar batteries, each individual cell of a shaded battery being electrically connected in parallel but in opposite polarity with a corresponding cell of an illuminated solar battery, the p-n junction solar cell of the shaded battery behaving as a forward biased diode forming a by-pass conducting path around the corresponding illuminated cell should it become non-conductive to thereby achieve an uninterrupted generation of electrical current by the remaining illuminated cells of the solar battery containing the non-conducting cell.

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**3,673,000**

## ANTIMAGNETIC ALKALINE MINIATURE GALVANIC CELL

**Paul Ruetschi, Yverdon, Switzerland, assignor to Leclanche S.A., Yverdon, Vaud, Switzerland**

**Filed Apr. 27, 1970, Ser. No. 32,172**
**Claims priority, application Switzerland, May 1, 1969, 6,702**
**Int. Cl. H01n *21/00***
**U.S. Cl. 136—107** **7 Claims**

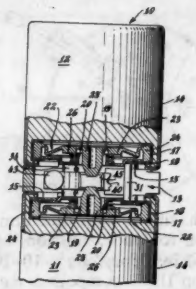
A non-magnetic alkaline minature galvanic cell having a positive electrode containing a metallic oxide has a nickel alloy housing containing at least 65% nickel and a resilient laminated closure having a spring bronze laminae in electrical contact with the negative electrode.

**3,673,001**

## CONTROL MEANS FOR A RECHARGEABLE BATTERY

**Robert J. Tolmie, Fairfield, Conn., assignor to Sperry Rand Corporation, New York, N.Y.**

**Filed June 29, 1970, Ser. No. 50,573**
**Int. Cl. H01m *1/04***
**U.S. Cl. 136—110** **7 Claims**



Means to control the charging of a rechargeable battery and which means include a spring restrained pressure responsive diaphragm within the battery and a pair of electrical contacts in circuit with the battery and the charging means for the battery. A switch actuator is moved by the diaphragm to actuate the contacts and open the battery charging circuit when a predetermined charge condition of the battery is reached.

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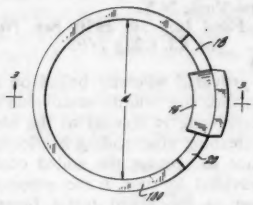
**3,673,002**

## CARRIER FOR VARIABLE BATTERY RETENTION

**Walter R. Vignini, Peekskill, N.Y., assignor to Sonotone Corporation, Elmsford, N.Y.**

**Filed June 1, 1970, Ser. No. 42,089**
**Int. Cl. H01m *1/04***
**U.S. Cl. 136—173** **2 Claims**



An interference fit is provided for a battery inserted in a carrier for hearing aid use. The degree of interference is such as to retain the battery in place prior to insertion of the carrier into the hearing aid housing to facilitate its handling. The interference is reduced, however, when the carrier is inserted into the housing by a camming surface included therein. Such arrangement establishes almost a "floating" condition for the battery when the carrier is in normal operating position, to simplify battery contact spring design.

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**3,673,003**

## THERMOCOUPLE FOR NUCLEAR ENVIRONMENT

**Carrol Dean Starr, Whippany, and Teh Po Wang, Cedar Grove, N.J., assignors to Wilbur B. Driver Company**

**No Drawing. Filed Sept. 18, 1969, Ser. No. 859,203**
**Int. Cl. H01v *1/22***
**U.S. Cl. 136—236** **5 Claims**

A thermocouple which exhibits substantially no change in composition when exposed to neutron irradiation. The

positive thermoelement of this thermocouple comprises, as expressed in percent by weight:

8%–10% chromium;
0%–1.5% silicon; and
Balance—nickel

The negative thermoelement of this thermocouple comprises, as expressed in percent by weight:

25%–35% chromium;
0%–1.5% silicon; and
Balance—nickel

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**3,673,004**
**METHOD OF MAKING PISTON RINGS**
**Traian Dumitrescu, Bucharest, Rumania, assignor to Institutul de Ceretari Tehnologice Pentru Constructii de Masini**
**No Drawing. Filed July 23, 1970, Ser. No. 57,800**
**Int. Cl. B22d *15/02, 25/06***
**U.S. Cl. 148—3** **6 Claims**

A method of making piston rings for internal-combustion engines, external-combustion engines such as steam engines, air compressors and the like in which the rings are individually cluster cast from an alloy-cast iron containing 4.0 to 5.0% silicon, 0.6 to 1.2% by weight manganese and 0.2 to 0.7% by weight phosphorus. The cast iron is treated in the liquid state with bismuth to yield a raw metallurgical structure, upon casting, of cementite, pearlite, ledeburite and a phosphoric eutectic.

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**3,673,005**
**PROCESS FOR BORATING METALS, ESPECIALLY STEEL**
**Helmut Kunst, Niedersachsen, Germany, assignor to Elektroschmelzwerk Kempten G.m.b.H., Munich, Bavaria, Germany**
**No Drawing. Filed Sept. 18, 1969, Ser. No. 859,172**
**Int. Cl. C23c *9/04***
**U.S. Cl. 148—6** **5 Claims**

Process for borating metals in which the metal is treated with a pulverized borating agent containing a fluoborate and/or boron fluoride as an accelerating agent.

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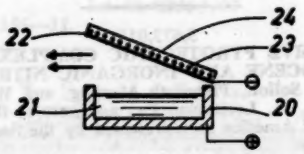
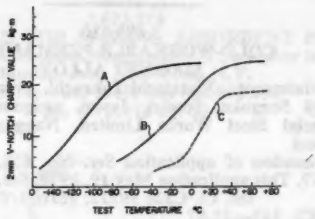
**3,673,006**
**METHOD AND APPARATUS FOR SURFACE COATING ARTICLES**
**Emile Plumat, Gilly, and José Lelong, Fleurus, Belgium, assignors to Glaverbel S.A., Watermael-Boitsfort, Belgium**
**Filed Sept. 9, 1968, Ser. No. 758,334**
**Claims priority, application Great Britain, June 26, 1968, 30,531/68; Luxembourg, Sept. 18, 1967, 54,489**
**Int. Cl. C23c *11/00, 13/00***
**U.S. Cl. 117—106 R** **10 Claims**




Method and apparatus for applying a substance vaporizable by electron bombardment to a surface to form a coating thereon. The substance is vaporized in a vacuum by being bombarded with electrons. The vapor, thus formed, travels from where it is formed and is deflected onto such surface to coat the same.

**3,673,007**
**METHOD FOR MANUFACTURING A HIGH TOUGHNESS STEEL WITHOUT SUBJECTING IT TO HEAT TREATMENT**
**Katao Miyano and Masahide Shimazaki, Muroran, Japan, assignors to Japan Steel Works Ltd., Tokyo, Japan**
**Filed Nov. 14, 1969, Ser. No. 876,919**
**Claims priority, application Japan, Nov. 29, 1968, 43/87,011**
**Int. Cl. C21d *1/02, 7/14***
**U.S. Cl. 148—12** **1 Claim**




A high toughness steel especially adapted to be used as a material for constructions to be used at low temperatures is manufactured by the steps of making an ingot by adding to a fundamental steel having a composition of from 0.03% to 0.13% carbon, 0.10% to 0.60% silicon, from 0.20% to 2.00% manganese, up to 0.035% aluminium and the balance being iron and impurities, at least one element selected from the group consisting by weight of up to 0.2% niobium, up to 0.2% vanadium, up to 0.15% titanium, up to 0.20% zirconium and up to 0.30% tantalum; rough hot rolling or forging the ingot to form a billet or slab; the billet or slab being cooled during said rolling or forging to below the $A_1$ transformation point; uniformly reheating the billet or slab from below the $Ar_1$ transformation point at its final rolling or forging stage to a temperature within 150° C. above the $Ac_3$ transformation point; working the billet or slab to cause a more than 10% thickness reduction, said working being completed at a temperature in the vicinity of the $Ar_3$ transformation point; and air cooling or furnace cooling the slab or billet to room temperature.

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**3,673,008**
**CARBONITRIDING AND OTHER THERMAL TREATMENT OF COLUMBIUM STEELS**
**Mahlon E. Wood, Farmington, Mich., assignor to National Steel Corporation**
**No Drawing. Filed Apr. 25, 1969, Ser. No. 819,424**
**Int. Cl. C21d *1/74, 7/00***
**U.S. Cl. 148—12** **12 Claims**

Ferritic grain coarsening, and concomitant loss of strength and fatigue properties, are avoided in carbonitriding and other processes in which cold-formed steel articles are heated above the strain recrystallization temperature but below the $A_3$ critical temperature. Use of steel containing about 0.006–0.018% columbium for cold-formed parts heated to carbonitriding temperatures produces an ASTM grain size of 5 or finer.

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**3,673,009**
**METHOD FOR PRODUCING A PART FROM STEEL SHEET**
**Bernard S. Levy, Chicago, Ill., assignor to Inland Steel Company, Chicago, Ill.**
**No Drawing. Continuation-in-part of application Ser. No. 743,295, July 9, 1968. This application Dec. 17, 1969, Ser. No. 885,979**
**Int. Cl. C21c *9/46***
**U.S. Cl. 148—12.3** **11 Claims**

Steel having 0.04 wt. percent carbon and 0.25–1.00 wt. percent manganese is provided with a strengthening addi-

tion of either (1) 0.008 wt. percent nitrogen or (2) said nitrogen content plus 0.05–0.25 wt. percent silicon. The steel is rolled into a coil of rolled steel sheet having a yield strength of about 40,000–50,000 p.s.i. A steel part is formed from the sheet in a forming operation which increases the yield strength to about 60,000–65,000 p.s.i.; and the steel part is then age hardened at an elevated temperature to increase the yield strength to about 65,000–75,000 p.s.i. An optional heavy temper roll is performed when the forming operation is relatively mild.

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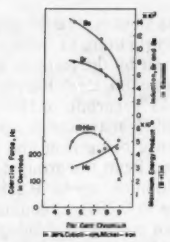
## 3,673,010
## COLD-WORKABLE PERMANENT MAGNET ALLOY

**Jiro Matsumoto, Masatoshi Takeuchi, Arimichi Abe, and Koji Sengoku, Sendai, Japan, assignors to Tohoku Special Steel Works Limited, Naga-machi, Sendai, Japan**

**Continuation of application Ser. No. 638,199, May 15, 1967. This application May 19, 1970, Ser. No. 34,513**
**Int. Cl. C22c *39/12*; H01f *1/04***
**U.S. Cl. 148—31.57** **1 Claim**



A permanent magnet alloy mainly containing Co, Ni, Cr and Fe and having a replacement relation between Co and Ni of Co wt. percent=50–2.5(Ni wt. percent)~53–1.5(Ni wt. percent), which can very easily be subjected to mechanical working and cold working and yet is very cheap owing to the presence of less than 1% by weight of V contrary to Vicalloy containing 10–14% by weight of V.

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## 3,673,011
## PROCESS FOR PRODUCING A CESIUM COATED GALLIUM ARSENIDE PHOTOCATHODE

**Gene Strull, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Original application Mar. 7, 1969, Ser. No. 805,130. Divided and this application Nov. 2, 1970, Ser. No. 86,202**
**Int. Cl. H01l *7/34, 15/06***
**U.S. Cl. 148—175** **4 Claims**

A photocathode is comprised of a monocrystalline layer of gallium arsenide grown on either a germanium or a gallium arsenide substrate. A monatomic layer of cesium is disposed on the monocrystalline layer. An electric contact affixed to the photocathode provides a means for connecting it electrically into electrical circuits. The gallium arsenide and the cesium are deposited on the substrate in essentially one continuous growth process.

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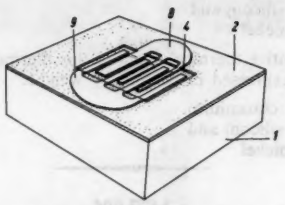
## 3,673,012
## METHOD OF PRODUCING A TRANSISTOR

**Reinhold Kaiser, Heilbronn, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm (Danube), Germany**

**Filed July 29, 1969, Ser. No. 845,773**
**Claims priority, application Germany, Aug. 1, 1968, P 17 64 766.4**
**Int. Cl. H01l *7/44***
**U.S. Cl. 148—187** **2 Claims**

The invention relates to a method of producing a transistor, such as a control transistor in which the emitter regions are formed by diffusion through strip-like apertures in an insulating layer on a semiconductor body. The




strips are positioned side by side and decrease in width in the direction of succession of the strips.

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## 3,673,013
## ILLUMINATING FLARE COMPOSITION

**George A. Lane, Midland, and William Arthur Smith, Westland, Mich., and Stephen C. Dollman, Morris Plains, Seymour M. Kaye, Dover, and Francis R. Taylor, Mount Arlington, N.J.; said Lane and said Smith assignors to The Dow Chemical Company, Midland, Mich., and said Dollman, said Kaye and said Taylor assignors to the United States of America as represented by the Secretary of the Army**

**No Drawing. Filed Oct. 6, 1970, Ser. No. 78,643**
**Int. Cl. C06d *1/10***
**U.S. Cl. 149—19** **10 Claims**

Disclosed is an illuminating flare composition comprising particulate magnesium as fuel, an alkali metal nitrate or perchlorate as oxidizer together with a binder system containing a high percentage of oxygen. The binder system is made up of the reaction product of an amine or acid anhydride curable epoxy resin and an amine terminated composition or acid anhydride as curing agent together with a plasticizer containing at least 40 percent oxygen.

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## 3,673,014
## FLARE COMPOSITION

**George A. Lane, Midland, and William Arthur Smith, Westland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**No Drawing. Filed Oct. 6, 1970, Ser. No. 78,642**
**Int. Cl. C06d *1/10***
**U.S. Cl. 149—19** **7 Claims**

Disclosed is an illuminating flare composition which comprises a particulate alkali metal nitrate or perchlorate, as oxidizer, particulate magnesium as fuel, together with a binder. The binder comprises the reaction product of an amine or acid anhydride curable epoxy resin and an amine terminated composition or acid anhydride wherein the epoxy resin comprises from 30 to 70 percent of the binder. The binder is further characterized by containing at least 30 percent oxygen and making up from 18 to 24 percent of the flare composition.

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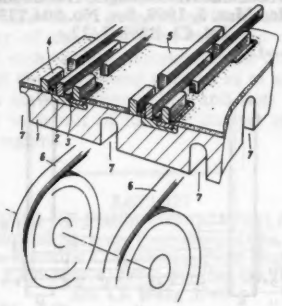
## 3,673,015
## EXPLOSIVE PYROTECHNIC COMPLEXES OF FERROCENE AND INORGANIC NITRATES

**Gilbert P. Sollott, Plymouth Meeting, and William R. Peterson, Jr., Levittown, Pa., assignors to the United States of America as represented by the Secretary of the Army**

**No Drawing. Filed May 23, 1969, Ser. No. 827,161**
**Int. Cl. C06f *3/06***
**U.S. Cl. 149—29** **25 Claims**

New explosive and/or pyrotechnic complexes are formed from ferrocene and its derivatives with specified inorganic nitrates, i.e., mercuric, ceric, and cupric, each of these nitrates known generally as being insensitive to sparks or impact.

3,673,016
**METHOD OF DIVIDING A SEMICONDUCTOR WAFER**
Dieter Gerstner, Willsbach, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm (Danube), Germany
Filed Dec. 1, 1969, Ser. No. 881,151
Claims priority, application Germany, Dec. 2, 1968, P 18 12 129.4
Int. Cl. H01l 7/50
U.S. Cl. 156—6 7 Claims

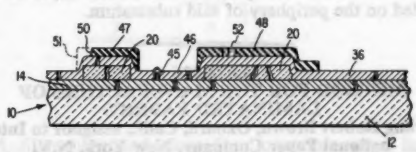


A method of dividing a semiconductor wafer having a plurality of components or circuits at one face of the wafer comprising partially sawing the wafer from the opposite face of the wafer along lines for the division of the wafer into individual components or circuits so that along these lines the thickness of the wafer is reduced in comparison to the remainder of the wafer, and etching the sawn face of the wafer without the use of a mask to complete the division. The method is particularly suitable for use with wafers, having thick self supporting conducting paths which extend over the surface of the wafer and are connected to the electrodes of the components or circuits.

3,673,017
**PARTICLE TRACK ETCHING METHOD**
David D. Peterson, Bristol, England, assignor to General Electric Company
Filed July 9, 1970, Ser. No. 53,495
Int. Cl. B44c 1/22; C23f 1/00
U.S. Cl. 156—7 5 Claims

A new particle track etching method is disclosed wherein a smoother and more uniform track profile is obtained by controlling the chemical concentrations of the reagents and products so that the etching occurs at a uniform rate. Specifically, the etchant is maintained saturated with etch products throughout the entire etching procedure.

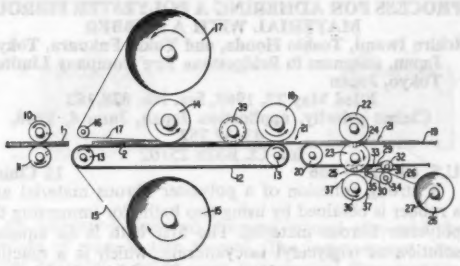
3,673,018
**METHOD OF FABRICATION OF PHOTOMASKS**
Andrew G. F. Dingwall, Somerville, N.J., assignor to RCA Corporation
Filed May 8, 1969, Ser. No. 823,051
Int. Cl. C23f 1/02
U.S. Cl. 156—11 3 Claims



A photomask has multilayer opaque patterns on a transparent substrate. Each pattern includes a bottom layer and a top layer, each of a material capable of being etched by a substance which will not etch the substrate, and an intermediate layer of a material capable of being etched by a substance which will not etch the bottom and top layers. The several layers compensate for defects in each layer.

An improved photomask fabrication method includes forming the abovementioned patterns by successively depositing the bottom and intermediate layers, photoetching the intermediate layer into a desired pattern, depositing the top layer, and then photoetching the top and bottom layers into a desired pattern.

3,673,019
**APPARATUS FOR MAKING ABSORBENT PADS**
Arthur B. Erekson, Scarsdale, N.Y., assignor to Borden, Inc., New York, N.Y.
Filed Nov. 20, 1969, Ser. No. 878,390
Int. Cl. A41h 37/00
U.S. Cl. 156—66 9 Claims



Improvement in apparatus and method for producing disposable absorbent pads, such as diapers, comprising applying pressure-sensitive strips of adhesive tape to the diapers by means of apparatus which includes conveyor belt for advancing diapers, the conveyor belt being narrower than the diapers thus allowing the side edges of the diapers to extend beyond the conveyor belt; reel of adhesive tape ribbon disposed at each side and below the conveyor belt; rotatable drum, provided with suction valves, positioned below the overlapping side edges of the diapers, means for advancing the ribbon against the drum whereby the ribbon is held against the drum by the suction valves, rotatable cutting means for severing the ribbon into strips of adhesive tape while the ribbon is held against the drum, situated at each side and below the conveyor belt; and rotatable pressure roll, disposed directly above the rotatable drum, for affixing the strip of adhesive tape to the overlapping edges of the diapers in cooperation with the rotatable drum.

3,673,020
**PROCESS FOR THE MANUFACTURE OF PARTICLE BOARDS UTILIZING A DRY ORGANIC BINDER**
Norbert Maurice De Jaeger, 264 Avenue Geavaert a, Genval, Belgium
No Drawing. Filed Mar. 4, 1969, Ser. No. 804,302
Claims priority, application Luxembourg, Mar. 11, 1968, 55,657
Int. Cl. B29j 5/00
U.S. Cl. 156—62.2 13 Claims

A process for the manufacture of boards consisting of at least one layer, wherein sawdust having a particle size below 1 mm. is mixed with a quantity of binding agent ranging between 5% and 15% of the weight of the dry sawdust, and a layer is formed by spreading the mixture in a layer of such a thickness that a final layer of a thickness ranging between 0.5 mm. and 5 mm. is obtained, and by simultaneously applying a pressure ranging between 80 kg./cm.$^2$ and 150 kg./cm.$^2$ at a temperature ranging between 130° C. and 180° C.

A process in which an agent increasing the internal heat resistance is added to said mixture.

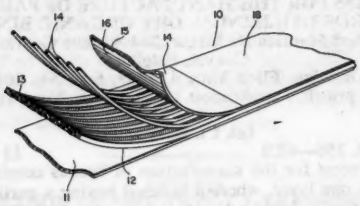
3,673,021
**METHOD OF MAKING A LAMINATED MAT FROM PLIES OF FIBROUS PULP MATERIAL**
Curt G. Joa, Town of Ocean Ridge, Fla.
(Box 1121, Boynton Beach, Fla. 33435)
Filed Feb. 3, 1969, Ser. No. 795,840
Int. Cl. B29j 5/00
U.S. Cl. 156—62.4 3 Claims

A composite mat of laminated separately formed plies of pulp fibers picked from a pulp board and sprayed with adhesive while airborne to thoroughly expose the fibers to the adhesive before the ply is formed. Such multiple plies are laminated and bound together by said adhesive into said composite mat. The apparatus comprises a tandem series of pulp fiberizers which concurrently form such plies and laminate the plies into said composite mat.

3,673,022
**PROCESS FOR ADHERING A POLYESTER FIBROUS MATERIAL WITH A RUBBER**
Ichiro Iwami, Toshio Honda, and Yukio Fukuura, Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed May 27, 1969, Ser. No. 828,162
Claims priority, application Japan, June 4, 1968, 43/37,752
Int. Cl. B32b 25/02
U.S. Cl. 156—166 12 Claims

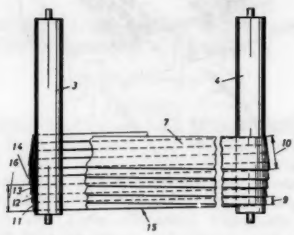
A strong adhesion of a polyester fibrous material and a rubber is obtained by using two baths for immersing the polyester fibrous material. The first bath is an aqueous solution of triglycidyl isocyanurate, which is a reaction product of isocyanuric acid and epichlorohydrin and this bath may be added with a second component of an amine, amine derivative, polybasic carboxylic acid or polybasic acid anhydride. The second bath is an aqueous solution of a resorcin-formaldehyde resin and a rubber latex solution. Namely the polyester fibrous material is immersed in the first bath and the immersed fibrous material is applied to a heat-treatment and then immersed in the second bath, thereafter applied to again a heat-treatment and the thus treated fibrous material is contacted with a vulcanizable rubber composition and the assembly is subjected to a vulcanization.

3,673,023
**PROCESS OF PRODUCING REINFORCED LAMINATE**
William C. Ross, Winchester, Mass., assignor to W. R. Grace & Co., Cambridge, Mass.
Filed June 24, 1970, Ser. No. 49,396
Int. Cl. B29h 7/22; B32b 3/12, 31/26; F16g 1/10
U.S. Cl. 156—137 3 Claims



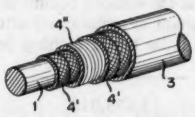

Flexible laminated products such as printing blankets, belts, and the like of exceptionally high tensile strength are made by laying helically wound, continuous reinforcing cords in what is essentially a screw thread or threads extending between the lateral margins. A guide which automatically lays the cord in the helical groove bears teeth engaging the grooves on the base ply. Grooves are deep enough to house the cord. Walls between successive turns are thick enough to insulate the cords and prevent abrasive contact. The product is finished by a top ply laid over the wound carcass.

3,673,024
**METHOD FOR THE MANUFACTURE OF ENDLESS DRIVE BELTS AND CONVEYOR BANDS**
Erik Birger Eriksson, Halmstad, Sweden, assignor to Nordiska Maskinfilt Aktiebolaget, Halmstad, Sweden
Filed Mar. 6, 1969, Ser. No. 804,773
Int. Cl. B29h 7/22
U.S. Cl. 156—137 10 Claims




The invention relates to a method for the manufacture of endless belts and bands. The method is carried out in such a way that a rather narrow bat having fibres orientated essentially in the longitudinal direction is wound over and between two parallel rollers and the web thus obtained is needled in a needling machine. The invention also embraces a machine for carrying such a method into effect.

3,673,025
**METHOD OF MAKING A POLYURETHANE RUBBER COVERED ROLL**
Yasuo Fukuyama and Yosuke Okada, Hirakata-shi, Japan, assignors to Yamauchi Rubber Industry Co., Ltd., Osaka, Japan
Original application Oct. 23, 1968, Ser. No. 769,844, now Patent No. 3,490,119. Divided and this application Aug. 11, 1969, Ser. No. 862,127
Int. Cl. B65h 81/00
U.S. Cl. 156—154 5 Claims




This polyurethane rubber covered roll consists of a metal core fixed by winding with a fiber previously impregnated with thermosetting resin solution to form a substratum and then a polyurethane rubber layer is cast molded on the periphery of said substratum.

3,673,026
**METHOD FOR THE MANUFACTURE OF LAMINATED FABRICS**
Stirling Robert Brown, Oxnard, Calif., assignor to International Paper Company, New York, N.Y.
Filed Jan. 12, 1970, Ser. No. 2,002
Int. Cl. B32b 31/08
U.S. Cl. 156—164 24 Claims

A method for the manufacture of laminated fabrics wherein separate webs are differentially stretched and

bonded in superposed relation by means of limited bondings separated by substantial unbonded regions. Thereafter the bonded webs are relaxed, whereupon one web contracts more than the other web, and the webs separate in the unbonded regions. The webs also may be individually deformed before being superposed so as to project a portion of the fibers of each web out of the plane of each web in a pattern over substantially the entire surface area of each web and provide relatively premanently set interruptions in the planar structure of said web on at least one surface of the web for purposes of increasing the stretchable quality of the webs. The deformed webs may be superposed with surface interruptions of one web facing inwardly of the superposed webs so as to abut the other web or its surface interruptions and thus maintain the superposed webs out of intimate contact at least in the unbonded regions.

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**3,673,027**
**METHOD OF FORMING COATED FIBERS**
**Samuel Binford Spencer, Perrysburg, Ohio, assignor to Johns-Manville Corporation, New York, N.Y.**
**Filed May 4, 1970, Ser. No. 34,152**
**Int. Cl. D02g *3/40***
**U.S. Cl. 156—167** **9 Claims**

A strand is made up of a large number of continuous filaments bonded together by a plastic coating, and is particularly suited for chopped strand employed in a matrix of plastic compatible with the coating where the coating binds the filaments when divided into short strand lengths.

Strand is drawn under tension over a surface to separate the filaments and is passed through a mass of finely divided particles of the coating plastic. Particles adhere to and are carried with the strand into a heated region where the softening temperature of the plastic is reached. The plastic flows and coalesces to form a binding coating on the cooled strand which retains its integrity when chopped or otherwise severed into short lengths.

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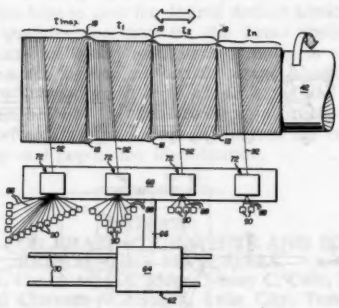
**3,673,028**
**GLASS FIBER CONTAINER AND METHOD OF CONSTRUCTION**
**Lee E. Pearson, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio**
**Filed Oct. 1, 1969, Ser. No. 862,727**
**Int. Cl. B31c *9/00, 13/00***
**U.S. Cl. 156—172** **3 Claims**



A filament-wound glass fiber container of a hollow tubular configuration having a wall composed of a plurality of discontinuous axially overlapping sections integrated with one another at the areas of overlap to form a homogeneous monolithic body. Also disclosed is a method of producing the container. The method includes the steps of simultaneously winding a plurality of spaced apart axially aligned groups of resin saturated glass fiber strands on a core, each group being wound in partially overlapping relation to the group or groups immediately adjacent to it and forming a predetermined section of the wall of the container. Thereafter the resin is cured.

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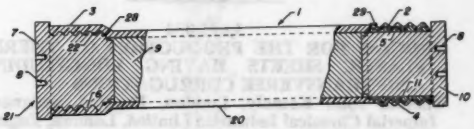
**3,673,029**
**METHOD OF MAKING A THREADED FILAMENT WOUND PIPE**
**Jack Lowrie McLarty, Milwaukee, Wis., assignor to Universal Oil Products Company, Des Plaines, Ill.**
**Original application July 9, 1969, Ser. No. 840,403. Divided and this application July 31, 1970, Ser. No. 64,930**
**Int. Cl. B65h *81/00***
**U.S. Cl. 156—175** **5 Claims**



An improved threaded filament wound pipe and the method of manufacture thereof. The improvement comprises helically winding resin impregnated fiberglass filaments upon a mandrel knurled at the ends in the form of helical threads. The helpical winding pitch is greater than the thread pitch. As a result, the fiberglass filaments alternately deviate in radial disposition with respect to the pipe axis, thereby forming both interior and exterior pipe threads at the ends of the finished pipe.

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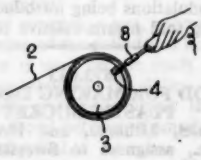
**3,673,030**
**METHOD FOR MANUFACTURING ARTICLES MADE OF FLEXIBLE PLASTIC**
**Philippe Blanc de La Naulte, Paris, and Roland Ginhoux, Le Perreux, Val-de-Marne, France, assignors to Comptoir Europeen de Distribution et de Representation, Paris, France**
**Filed Feb. 13, 1970, Ser. No. 11,172**
**Claims priority, application France, Feb. 13, 1969, 693,483**
**Int. Cl. B65h *81/00***
**U.S. Cl. 156—193** **3 Claims**



A method of manufacturing articles made of a flexible plastic, notably polyethylene, supplied in the form of a roll of a continuous sheet, which comprises: constituting, as the unrolling of a predetermined length of said continuous sheet proceeds, a stack of parallel layers formed by moving the continuous sheet at constant rate and always in the same direction; locally interlocking together the stacked layers; slicing through said layers in a region spaced relative to said region where said layers are joined together; flattening out the stack of sliced layers in order to obtain a pile of layers; and cutting through the pile of layers to the pattern of the article to be made up.

3,673,031

## METHOD OF PRODUCING A LAMINATE FOR USE AS A LAYER IN A CORRUGATED BOARD

Veikko Mauri Moilanen, Imatra, Finland, assignor to Enso-Gutzeit Osakeyhtio, Imatra, Finland

No Drawing. Continuation-in-part of application Ser. No. 579,453, Sept. 6, 1966. This application July 2, 1970, Ser. No. 52,069

Int. Cl. B31f 1/22

U.S. Cl. 156—206 5 Claims

A method of producing a laminate for use in making corrugated board which is strong and resistant to severe weather conditions and which withstands rough handling. A substantially uniform layer of synthetic resinous material is applied between two webs of fibrous material, which material can be glued with conventional water miscible glues, the resinous material layer is bonded to the webs without finally hardening the layer, so that the laminate may then be shaped and the layer finally hardened.

3,673,032

## PROCESS FOR THE PRODUCTION OF THERMOPLASTIC SHEETS HAVING LONGITUDINAL AND TRANSVERSE CORRUGATIONS

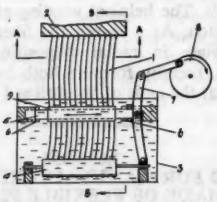
Thomas John Komoly, London, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of application Ser. No. 570,586, Aug. 5, 1966. This application Mar. 17, 1971, Ser. No. 125,433

Claims priority, application Great Britain, Aug. 6, 1965, 33,736/65

Int. Cl. B31f 1/20

U.S. Cl. 156—210 14 Claims



Thermoplastic polymeric sheet of improved rigidity is formed by passing a longitudinally corrugated extruded thermoplastic polymeric sheet in the longitudinal direction between two means for introducing further corrugations or undulations in said sheet, whereby the sheet is permitted to move in the longitudinal direction but restrained from movement in any other direction relative to the points, said sheet being in a mouldable state during at least part of its travel between said means and further corrugations or undulations being introduced into said sheet by reciprocating said means relative to one another.

3,673,033

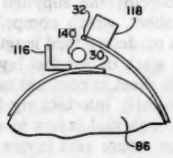
## METHOD FOR MAKING DISPOSABLE PLASTIC BUCKET

Gene MacDaniel, Lithonia, and Howell T. McElvy, Decatur, Ga., assignors to Sweethart Plastics, Inc., Wilmington, Mass.

Filed Feb. 2, 1970, Ser. No. 7,995

Int. Cl. B29d 27/00; B31b 17/74

U.S. Cl. 156—217 9 Claims



A method for producing two-piece containers wherein a turret carrying a plurality of container forms each has applied to it a side wall and a separately preshaped bottom, and as the turret rotates through successive stations, the side seam of the side wall is heat sealed closed, and the preformed bottom is heat sealed to the bottom of the side wall. Thereafter on a secondary turret the container rim is rolled and the fully formed container is ejected from the machine.

3,673,034

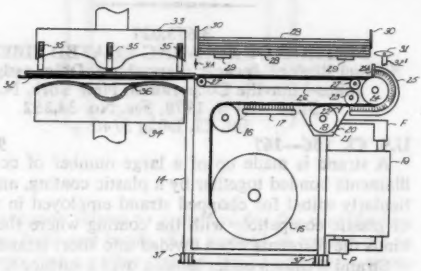
## METHOD FOR COATING, LAMINATING, AND MOLDING AUTOMOBILE FLOOR COVERINGS

William H. Squier, 104 Eastbourne Road, Greenville, S.C. 29611

Filed May 5, 1969, Ser. No. 821,924

Int. Cl. B29c 3/00

U.S. Cl. 156—222 6 Claims



A process is disclosed for the molding of automotive floor coverings. A molten thermoplastic composition is applied to the back of a length of carpet. The carpet is immediately laminated to a backing pad and the laminate is immediately formed in a mold.

3,673,035

## METHOD OF MANUFACTURING CARBON FIBRES

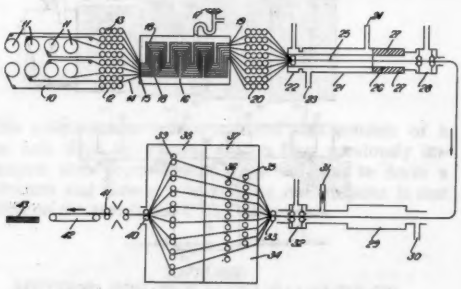
Ian Whitney, Wirksworth, England, assignor to Rolls-Royce Limited, Derby, England

Filed Apr. 15, 1969, Ser. No. 816,202

Claims priority, application Great Britain, Apr. 19, 1968, 18,617/68

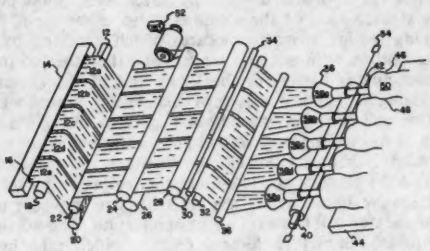
Int. Cl. C01b 31/07, 47/32; B32b 31/12

U.S. Cl. 156—235 6 Claims



A method of manufacturing carbon fibres, particularly in the form of a sheet or tape, in which a plurality of sheets or tapes of polyacrylonitrile fibres are fed through a furnace or furnaces in which at least the majority of the constituents other than carbon are driven off, the plurality comprising at least $10^5$ fibres.

3,673,036
**METHOD AND APPARATUS FOR FORMING ARTICLE FILLED WITH FILAMENT FIBERFILL**
Jerome G. Lipe, Jacksonville, Ala., assignor to Celanese Corporation, New York, N.Y.
Filed Aug. 5, 1970, Ser. No. 61,123
Int. Cl. B65b *1/16, 5/00, 63/00*
U.S. Cl. 156—250 14 Claims



A process for filling a plurality of articles with continuous filament fiberfill comprising the steps of opening a crimped multifilament tow, spreading the opened tow, subdividing the opened tow, delivering each subdivision of the opened tow to a pneumatic propelling device, whereby the subdivided tow is bulked and propelled, discharging each subdivision of the tow into an enclosed zone of an article to be filled, and, when said article is filled, discontinuing delivery of new tow to the pneumatic propelling device, severing the tow downstream of the pneumatic propelling device, removing the filled article and replacing it with a new article to be filled, and resuming delivery of the new tow to the pneumatic propelling device. A corresponding apparatus and the filled article are also claimed.

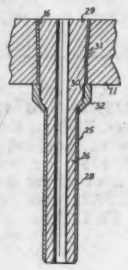
3,673,037
**METHOD OF MAKING A LAMINATED ARTICLE COMPRISING BLOOD OR SKIN TISSUE SAMPLES**
Clifford L. Reavis, Jr., Garland, Tex., assignor to Intelectron Corporation, New York, N.Y.
Filed Mar. 26, 1969, Ser. No. 810,593
Int. Cl. B32b *31/00*
U.S. Cl. 156—280 8 Claims

A process for the preparation of a plastic base material such as a film tape to gain the desired surface tension and adherence qualities necessary for the direct application and processing of blood and tissue samples in such a manner that the optical properties of the plastic base material are retained and the processed blood and tissue samples can be viewed both under a microscope and utilizing conventional projection techniques for cellular morphology and population identification.

3,673,038
**METHOD FOR BRAZING GRAPHITE AND OTHER REFRACTORY MATERIALS**
Domenic A. Canonico, Oak Ridge, Nancy C. Cole, Knoxville, and Clarence W. Houck, Lake City, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission
No Drawing. Filed Apr. 14, 1970, Ser. No. 28,539
Int. Cl. B32b *15/00*
U.S. Cl. 29—195 1 Claim

The present invention is directed to a novel class of titanium-vanadium-chromium alloys which are particularly useful in brazing graphite and other refractory materials to themselves and to each other, and to the resultant brazed composites. Within the context of this invention, the refractory materials which can be joined by the hereinafter-defined brazing alloy are selected from such materials as tungsten, molybdenum, tantalum, rhenium, niobium, alloys thereof, and graphite.

3,673,039
**METHOD OF PREPARING POURING SPOUT**
Chester F. Todd, Corrollton, Ga., assignor to Southwire Company, Corrollton, Ga.
Original application Oct. 15, 1968, Ser. No. 767,729. Divided and this application Jan. 20, 1971, Ser. No. 107,916
Int. Cl. B65d *25/48*
U.S. Cl. 156—293 1 Claim



A long life pouring spout for pouring molten metal in a continuous casting system, wherein the body of the spout is fabricated of graphite and an insulating shield surrounds the pouring spout and prevents air from contacting the outside surface of the pouring spout.

3,673,040
**MOUNTING PREFORMED ROLLER ON SHAFT**
Edward D. Hill, 11212 Edgewater Drive, Cleveland, Ohio 44102
Filed Apr. 29, 1970, Ser. No. 32,843
Int. Cl. B29c *27/16*
U.S. Cl. 156—294 13 Claims

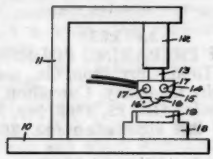
A roller, such as a printing roller, is fabricated by sliding a cylindrical body having a longitudinally extending, substantially central opening over a rigid shaft designed to support the roller during rotation or the like. The roller is preferably cut to a desired length from a preformed, relatively long section of the material. A lubricating adhesive is used for the joint purpose of first lubricating the relative sliding movement between the cylindrical body and shaft during assembly and then adhering these parts together after assembly.

In the preferred practice, a wet, polymerizable adhesive coatings the opening of the cylindrical body, and a second different adhesive is used on the shaft. The lubricity of both adhesives contributes to the sliding of the roller relatively to the shaft, and subsequently the two adhesives form an adhesive bond between themselves and the parts to which they are applied.

3,673,041
**HEAT SEALER**
Gerald L. Schulz, Holliston, and Raymond T. Mansur, Framingham, Mass., assignors to the United States of America as represented by the Secretary of the Army
Filed Sept. 8, 1970, Ser. No. 70,167
Int. Cl. B32b *31/00, 3/00;* C09j *5/00*
U.S. Cl. 156—306 3 Claims

Heat sealing opposed thermoplastic surfaces of open ended pouches, whose sealing surfaces are likely to be contaminated with liquids or fatty substances is accomplished by forcing a transversely radiused, heated sealing bar against the opposed unsealed sheets of the pouch

which are supported by a resilient anvil, thereby squeezing the contaminants out of the sealing area before the sheets fuse together and in those cases where solid particulate contaminants are found in the sealing area utilizing steam flushing to clean the sealing surfaces prior to sealing.



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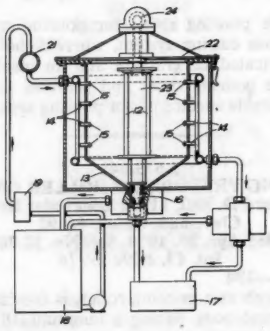
**3,673,042**

## GLASS POLISHING MACHINERY

**Colin Clayton Mayers, Radlett, England, assignor to Ian Low Smart, London, England**

**Filed Aug. 5, 1969, Ser. No. 847,686**
**Claims priority, application Great Britain, Aug. 5, 1968, 37,287/68**
**Int. Cl. C03c *15/02***
**U.S. Cl. 156—345** **4 Claims**



A method and apparatus for polishing glassware in which articles of glassware are placed in a vessel, and while remaining in the same vessel, are treated with streams of acid and rinse liquid. The glassware may be treated with detergent and neutralising liquid before and after the treatment with acid.

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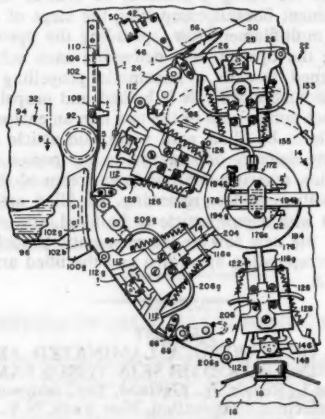
**3,673,043**

## APPARATUS FOR ADHESIVELY APPLYING SEALING STRIPS TO CONTAINER CLOSURES TO PREVENT UNAUTHORIZED REMOVAL OF THE CLOSURES WITHOUT DETECTION

**Sidney T. Carter, Shrewsbury, Mass., assignor to A-T-O Inc., Cleveland, Ohio**

**Filed Oct. 7, 1970, Ser. No. 78,652**
**Int. Cl. B65c *3/20***
**U.S. Cl. 156—363** **38 Claims**

Apparatus for adhesively applying sealing strips, for example, tax stamps, to the closures at the tops of containers comprising a wheel rotatable about a horizontal axis which has on it at spaced intervals grippers for clamping the sealing strips at one end thereto and affixing assemblies for applying sealing strips to the closures following application of adhesive thereto. Peripherally of the wheel there are at the top, a magazine for holding sealing strips and a picker for taking sealing strips from the magazines and presenting them to the grippers on the wheel; at one side adhesive-applying means for applying adhesive to the sealing strips; and at the bottom a conveyor for moving containers in succession to the wheel for application of the sealing strips thereto. The picker is controlled by a sensing device so as to remove sealing strips from the magazine only when there is a container on the conveyor ready to have a sealing strip applied thereto. The grippers are adjustable on the wheel relative to the affixing assemblies to center them with respect to the affixing assemblies for applying the sealing strips with equal portions at each side of the closures or to offset them for applying sealing strips to closures which are long from top to bottom with one end longer than the other so that at least one end overlaps the lower end of the closure. The adhesive applicator is provided with a grooved applicator roll for applying adhesive only to the marginal edges of the sealing strip so as to leave the center portion uncoated. A heated guide situated between the applicator roll and the place of application of the sealing strips keeps the adhesive liquid as the sealing strips are moved from the applicator roll to the place of application. The affixing assemblies comprise holding members which take hold of the ends of the sealing strips while still held at one end by the gripper and a spotter. The holding members and spotter are movable radially on the wheel toward the tops of the containers and relative to each other after a sealing strip is pressed against the top of a container to wipe the portions of the sealing strip at each side of the closure downwardly against the sides while holding the ends away from the container so that the ends will not become attached to the shoulders of the container. Alternately when the sealing strip is being applied to a long-necked bottle and there is no problem of bridging, the end portions of the sealing strip may be released at the time of application of the sealing strip to the closure. The sealing strip holding members are vacuum devices which hold the sealing strip ends until the sealing strip is applied, whereupon they are disabled and superatmospheric pressure is supplied to effect release and/or to blow the ends of the sealing strip free. The drive for the wheel embodies means for rotating the wheel at a speed compatible with picking the sealing strips from the magazine and applying adhesive most expeditiously and a pair of eccentric drive gears designed to speed up the rotation or slow it down as the case may be each time an assembly nears the place of application to synchronize the speed of the assembly with the linear speed of the containers. There is also means associated with the means for effecting radial movement of the assemblies at the place of application adapted to yield in the event of an oversize container to prevent shattering.

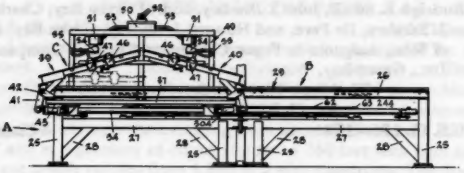


3,673,044

## PRODUCING INTERLAYERS FOR ANTENNA TYPE WINDSHIELDS

Alfred H. Miller, and Lee F. Johnson, both of Toledo, Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Sept. 10, 1969, Ser. No. 856,720
Int. Cl. H01q 1/32
U.S. Cl. 156—433 6 Claims



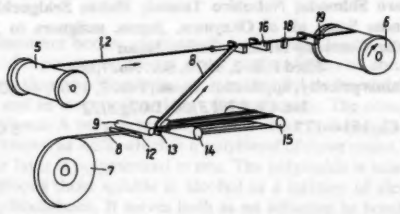
A method of and apparatus for preparing plastic sheets, to be used as interlayers in laminated antenna-windshield structures, by feeding a length of wire onto each sheet in a predetermined pattern, progressively heating the plastic in advance of the feeding wire and rolling the fed wire into the heated plastic, and then feeding a second length of wire onto and rolling it into the sheet in an identical but reversed pattern and in close proximity to the first length.

3,673,045

## METHOD AND APPARATUS FOR MAKING LEAD STRIP

Franz Baier, Teichstrasse 3, Saerback, and Rudolf Schmitz, Austum 43,, Emsdetten, both of Germany

Division of Ser. No. 580,326, Sept. 16, 1966. This application Dec. 3, 1970, Ser. No. 94,765
Claims priority, application Germany, Oct. 15, 1965, 4494634
Int. Cl. B65h 45/08
U.S. Cl. 156—438 13 Claims



A method and apparatus for making a lead strip to be secured to the lower edge of a curtain or drape as weight means in which the individual lead members are disposed in and surrounded by a relatively thin, hose-like sleeve made from a polyterephthalate foil strip which is formed into a tube upon insertion of the lead member, by means of a glued seam.

3,673,046

## APPARATUS FOR SPLICING SHEET MATERIALS

Carl R. Pepmeier, Fredericksburg, Va.; Joseph T. Sincavage, Media, and Louis E. Stoffregen, Springfield, both of Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed June 23, 1969, Ser. No. 835,510
Int. Cl. B32b 31/00
U.S. Cl. 156—517 4 Claims

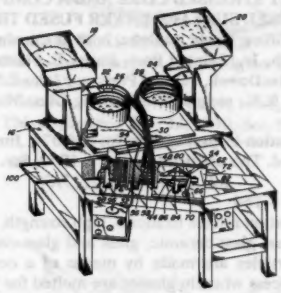
Apparatus for cutting severed end portions of sheet materials along substantially straight lines extending transversely thereof while such sheet materials are held fixed against flat surfaces by suction and thereafter connecting the newly formed ends in abutting and overlapped relationship.

3,673,047

## FLECHETTE ASSEMBLY MACHINE

Roy C. Buth, and Arthur F. Schroeder, both of Evansville, Ind., assignors to The United States of America as represented by the Secretary of the Navy

Filed Sept. 3, 1970, Ser. No. 69,223
Int. Cl. B32b 31/00; F42b 13/00, 39/00
U.S. Cl. 156—563 9 Claims



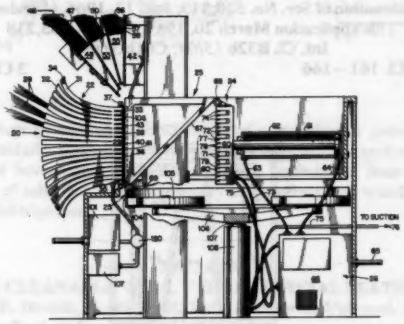
Flechettes loaded into a pair of storage hoppers are supplied to vibrating feeders where they are oriented and fed to a row of inclined dispensing devices that drop them onto a grooved assembly plate where the flechette fins are radially oriented. A cam driven notched shuttle arrangement pushes rows, alternately axially displaced by one fin length, under a stationary holding device which holds the flechettes in proper alignment as subsequent rows are pushed across the assembly plate and under the holding device. Rows of flechettes will emerge from the holding device as additional rows of flechettes are added by the shuttle and they are sprayed with an adhesive and then heated to dry the adhesive, leaving the flechettes bonded together in sheets which may be easily handled for subsequent packaging.

3,673,048

## APPARATUS FOR MAKING NON-WOVEN PILE MATERIAL

Lester Gidge, 61 Linwood St., and Valmor R. Poulin, Jr., 70 Forest Park Drive, both of Nashua, N.H.

Filed Aug. 13, 1969, Ser. No. 849,828
Int. Cl. B32b 31/20, 5/02
U.S. Cl. 156—510 20 Claims



A plurality of tows of parallelized strands are supplied to a head to present a compacted, but unconnected, mass of fiber ends in a selected pattern. The exposed ends of the mass are then joined into a unified backing by heat fusing or the like.

The mass is then moved out of the head, in a pile length increment by engagement with the pull the strand mass and tension the fiber ends, whereupon the mass is then severed transversely, to form a pile-bearing piece, tile or block of the desired color pattern, density, and pile height.

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**3,673,049**

**GLASS LAMINATED BODIES COMPRISING A TENSILELY STRESSED CORE AND A COMPRESSIVELY STRESSED SURFACE LAYER FUSED THERETO**

**James W. Giffen; David A. Duke, both of Corning; William H. Dumbaugh, Jr., Painted Post; James E. Flannery, Corning; John F. MacDowell, Painted Post, and John E. Megles, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.**

**Continuation-in-part of Ser. No. 735,074, June 6, 1968, abandoned. This application Oct. 7, 1970, Ser. No. 78,763**

**Int. Cl. B32b *7/02, 17/06***

**U.S. Cl. 161—164** **15 Claims**

This invention relates to sound, high strength, laminated articles of glass, glass-ceramic, glass and glass-ceramic materials. Such articles are made by means of a continuous hot-forming process wherein glasses are melted for the individual layers and these layers are then simultaneously fused together and shaped into a laminated structure of a desired configuration. Where a glass-ceramic article is desired, the laminated glass structure is subsequently heat treated in a particular manner to cause the glass to crystallize in situ.

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**ERRATA**

For Classes 161—129 and 161—146 see:
Patent Nos. 3,672,949 thru 3,672,952

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**3,673,050**

**LAMINATE OF A BARRIER LAYER ENCLOSED IN RIGID HIGH DENSITY POLYOLEFIN LAYERS**

**Ritchey O. Newman, Jr., Midland, and Walter J. Schrenk, Bay City, both of Mich., assignors to Dow Chemical Company, Midland, Mich.**

**Filed Feb. 5, 1970, Ser. No. 9,068**

**Int. Cl. B32b *27/08, 27/30, 27/32***

**U.S. Cl. 161—165** **16 Claims**

This invention provides economical multi-layer sheets that combine high barrier layers with thick layers of rigid high density polyolefins.

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**3,673,051**

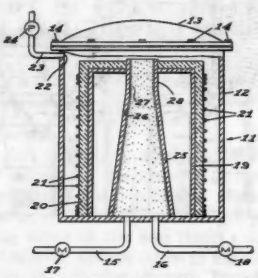
**PYROLYTIC GRAPHITE**

**Thomas J. Clark, Birmingham, and Howard W. Brown, St. Clari Shores, both of Mich., assignors to General Electric Company**

**Continuation of Ser. No. 520,213, Jan. 12, 1966, abandoned. This application March 20, 1969, Ser. No. 833,218**

**Int. Cl. B32b *15/04*; C01b *31/04***

**U.S. Cl. 161—166** **3 Claims**



Curved pyrolytic graphite bodies of increased thickness-to-radius ratios are produced by codepositing with the pyrolytic graphite a refractory metal in progressively decreasing quantities from the outer to the inner surface of the body. The addition of the refractory alloy metal lowers the stress levels and hence permits greater thicknesses of the pyrolytic graphite body.

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**3,673,052**

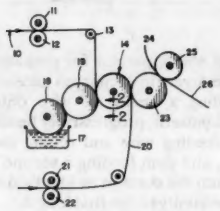
**METHOD OF MANUFACTURING A DISPOSABLE PRODUCT**

**Rudolph E. Small; John J. Bradley, both of Green Bay; Charles J. Sanders, De Pere, and Howard J. Slawny, Green Bay, all of Wis., assignors to Paper Converting Machine Company, Inc., Green bay, Wis.**

**Filed Sept. 18, 1968, Ser. No. 760,600**

**Int. Cl. B31f *1/18*; B32b *7/14***

**U.S. Cl. 156—164** **4 Claims**



A disposable product such as paper toweling made up of united sheets, at least one of which is of cellulose material, the adhesive joining the sheets being provided on areas which outstand from one of the sheets by virtue of being provided therein by a plate cylinder in a press arrangement.

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**3,673,053**

**ACRYLIC FIBERS WITH IMPROVED BRIGHTNESS AND PROCESS FOR PRODUCING THE SAME**

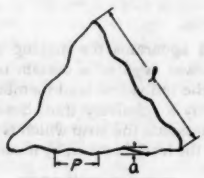
**Keitaro Shimoda; Nobuhiro Tsutsui; Hideto Sekiguchi, and Masao Sone, all of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan**

**Filed Feb. 2, 1970, Ser. No. 7,858**

**Claims priority, application Japan, Feb. 3, 1969, 44/8366**

**Int. Cl. B29f *3/00*; D02g *3/22***

**U.S. Cl. 161—177** **3 Claims**



An acrylic fiber with a triangular cross-section wherein the curved peripheral edge thereof is defined in accordance with formulas discussed herein. Also provided is a process for preparing these fibers, which exhibit improved brightness, by extruding a spinning solution through Y-shaped orifices into a coagulating bath, the inorganic salt concentration in the spinning solution and coagulating bath being within defined ranges, maintaining the delivery ratio within the range 0.5–3.0 and subjecting the filament to a series of stretching steps which include cold-stretching, primary hot-stretching and secondary stretching such that $16X_1+2.5X_2-3X_3 \leqq 31$

where $X_1$ is the cold-stretching ratio, $X_2$ is the primary hot-stretching ratio and $X_3$ is the secondary stretching ratio.

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3,673,054

## LAMINATED STRUCTURES AND METHOD

Archibald N. Wright, Schenectady; Victor J. Mimeault, Elnora, both of N.Y., and Edward V. Wilkus, Monroe, Conn., assignors to General Electric Company

Filed Jan. 19, 1970, Ser. No. 4,121
Int. Cl. B32b *31/28, 27/16, 15/08*
U.S. Cl. 161—189 13 Claims

Laminated structures are formed which are bonded by a novel fused tetrafluoroethylene polymer. The tetrafluoroethylene polymer is initially produced as a white powdery floc by irradiating tetrafluoroethylene monomer vapor at a temperature ranging from about 0° C to about 200° C and at a pressure of about 10 torr to 760 torr with light of wave length ranging from 1,800 to 2,400 Angstroms. The floc polymer is deposited on at least one surface of a lamina and a second lamina is placed over the deposited polymer to form a composite which is then heated to fuse the polymer and form the laminate.

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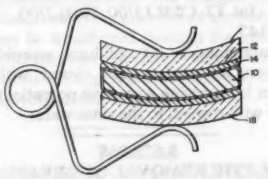
3,673,055

## LAMINATED TRANSPARENT BODIES HAVING MAR RESISTANT PROTECTIVE COATINGS

Clarence A. Sheld, 273 Thomas Ave., Rochester, N.Y., assignor to Bausch & Lomb, Incorporated

Filed March 30, 1970, Ser. No. 23,909
Int. Cl. B32b *27/30, 27/34*
U.S. Cl. 161—183 10 Claims




Transparent bodies, particularly ophthalmic lenses, having cores of super strong plastic, outer surface layers of abrasion resistant thermosetting resins such as the allyl and methacrylic esters and an intermediate later of a polyamide. The cores are of bisphenol-A polycarbonate, or of a clear, hetereogeneous blend known as ABS, which is a polyblend of three resins. The surface layer is polymerized in situ. The polyamide is selected from among those soluble in alcohol or a mixture of alcohol and hydrocarbons. It serves both as an adhesive to bond the surface layers securely to the cores and as a barrier agent to protect the cores from chemical attack by the monomer of the surface layer material. The surface layer is preferably cured in a mold which defines the shape and surface finish of the completed body.

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3,673,056

## TURF-LIKE PRODUCT AND METHOD OF MAKING IT

Martin L. Nadler, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 18, 1970, Ser. No. 90,612
Int. Cl. D04h *11/00*; A46d *1/00*
U.S. Cl. 161—62 11 Claims

A product having a turf-like appearance and useful as a playing field surface for football, baseball, or other games can be made in a wide variety of blade patterns and textures by (a) providing a liquid layer of polymeric matrix material (e.g., a foamable polyurethane composition) which can be solidified in situ to a desired degree of resilience and toughness; (b) providing a number of flexible polymeric ribbons; (c) making numerous width-wise cuts in one edge of each ribbon so as to form numerous blades (grass-blade-like elements) which are fastened together at their base; (d) forming a composite structure in which the ribbons are closely-spaced and in embedded relation with the liquid matrix layer whereby each ribbon has its length parallel with the matrix layer, its width perpendicular thereto, its blades upstanding therefrom, and a lower portion embedded therein; and (e) causing the matrix layer to solidify in situ.

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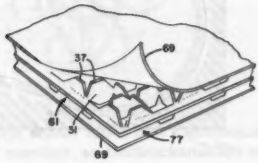
3,673,057

## CELLULAR STRUCTURES

Theodore H. Fairbanks, Liverpool, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 714,231, March 19, 1968, Pat. No. 3,616,025. This application July 22, 1970, Ser. No. 57,093
Int. Cl. B32b *3/12*
U.S. Cl. 161—68 5 Claims




A cellular structure having a plurality of walls extending along intersecting planes and together providing abutting cells, such walls being connected at their locations of intersection by cruciform sections and formed by flexing portions of a slit web material into planes disposed at angles to the plane of the original web material.

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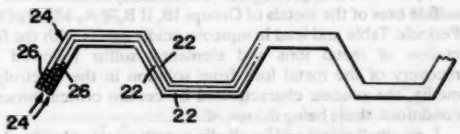
3,673,058

## HONEYCOMB HAVING LAMINATES OF UNIDIRECTIONAL STRANDS

Wendell T. Jackson, Walnut Creek; Beverley R. Garrett, Moraga, and Earl C. Vicars, Orinda, all of Calif., assignors to Hexcel Corporation, Dublin, Calif.

Filed April 7, 1969, Ser. No. 814,021
Int. Cl. B32b *3/12*
U.S. Cl. 161—68 5 Claims




A honeycomb core constructed of a plurality of generally sinusoidally shaped ribbons which are bonded together to define honeycomb cells. Each ribbon includes at least one layer of adjacent, unidirectionally oriented strands which are bonded together.

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3,673,059

## DRY CLEANABLE VINYL TYPE ARTIFICIAL LEATHER

Jack P. Brandt, South Bend, Ind., assignor to Uniroyal, Inc., New York, N.Y.

Filed May 13, 1970, Ser. No. 37,017
Int. Cl. B32b *7/10, 27/06*
U.S. Cl. 161—88 14 Claims

Blends of thermoplastic polyurethane elastomer, vinyl, chloride-vinyl acetate-vinyl alcohol terpolymer, and hexakis(methoxymethyl)melamine resin cast from solution and

cured by heating are resistant to dry cleaning. Material in the form of a sheet including a layer having the stated composition may have a patent leather finish, and the flexibility may be varied, for use in clothing or footwear, usually in combination with a textile fabric layer as a backing.

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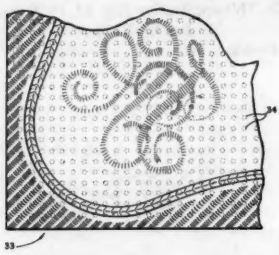
**3,673,060**

**ADHESIVELY LAMINATED CREPED DINNER NAPKIN**

James A. Murphy, and Stirling Robert Brown, both of Oxnard, Calif., assignors to International Paper Company, New York, N.Y.

Filed Jan. 12, 1970, Ser. No. 1,999
Int. Cl. B32b *3/02*
U.S. Cl. 161—126 5 Claims




An adhesively laminated creped tissue product, having particular usefulness as a dinner napkin, is formed from two creped tissue webs superposed with the lines of creping of each web substantially parallel to the lines of creping of the other, and patterned adhesive disposed between the webs. Each web is in a different condition of stress in the plane of the laminated product. The bonded webs may be formed into individual napkins embossed about their periphery, leaving a substantial unembossed area in the center.

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**3,673,061**

**PROCESS FOR THE RECOVERY OF METALS FROM SULFIDE ORES THROUGH ELECTROLYTIC DISSOCIATION OF THE SULFIDES**

Paul R. Kruesi, Golden, Colo., assignor to Cyprus Metallurgical Processes Corporation, Los Angeles, Calif.

Filed Feb. 8, 1971, Ser. No. 113,751
Int. Cl. C22d *1/00, 1/12, 1/16*
U.S. Cl. 204—105 R 20 Claims

A pollution-free process for the electrolytic dissolution of sulfide ores of the metals of Groups IB, II B, V A, VI A, of the Periodic Table and lead in aqueous acidic media with the formation of metal ions and elemental sulfur followed by recovery of the metal ions from solution in the electrolyte media, the process characterized by certain critical process conditions, these being the use of:

1. an alkali metal and/or alkaline earth metal chloride electrolyte,
2. a sulfide feed of average particle size smaller than 60 mesh U.S. Standard,
3. a pH range of about 0.01 – 3.9,
4. an electrolyte temperature range of about 60°–105° C., and
5. an anode current density above about 12 amperes/ft².

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**3,673,062**

**ELECTROWINNING OF METAL**

George Armstrong Smith, Kitwe, Zambia, and Donald Simon MacLeod, Cobalt, Ontario, Canada, assignors to New Nchanga Consolidated Copper Mines Limited

Filed Feb. 8, 1971, Ser. No. 113,736
Claims priority, application Zambia, Feb. 6, 1970, 15/70
Int. Cl. C22d *1/14;* C37d *1/22;* C22d *1/24*
U.S. Cl. 704—112 5 Claims

The invention deals with a process in which an electrolyte for the cathodic deposition of cobalt is made up by dissolving a precipitated cobalt hydroxide resulting from precipitation by lime. The advance electrolyte is passed through a bed of activated carbon so that sulphide, which has been traced to impurities in the lime, and other contaminants are removed.

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**3,673,063**

**PRODUCTION OF LEAD-TIN-TELLURIDE MATERIAL FOR INFRARED DETECTORS**

Shirley L. Wakefield, Cincinnati, Ohio, assignor to Avco Corporation, Cincinnati, Ohio

Filed March 31, 1971, Ser. No. 129,995
Int. Cl. C23b *3/06, 1/00;* B23p *1/00*
U.S. Cl. 204—140.5 6 Claims

The invention is a method of producing lead-tin-telluride material for use in making diffused junction photodiodes. Detector diodes which are made from such material can be produced directly from a wafer without the necessity of using conventional time-consuming back-etching. The steps of my method comprise slicing thin wafers from a pre-alloyed boule, mechanically polishing the sliced wafers to remove major imperfections in the flat surfaces, electropolishing said wafers to produce undamaged clean surfaces and finally annealing the sliced and polished wafers to reduce Hall carrier concentration.

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**3,673,064**

**METHOD OF ELIMINATING COPPER CONTAMINATION**

A. Eugene Blakeslee, Mount Kisco; Luther M. Foster, Chappaqua, and Thomas S. Plaskett, Ossining, all of N.Y., assignors to The United States of America as represented by the Secretary of the Army

Filed Oct. 29, 1970, Ser. No. 85,227
Int. Cl. C23f *13/00;* H01l *7/00*
U.S. Cl. 204—147 1 Claim

Copper contamination of gallium arsenide wafers is prevented when the wafers are rinsed with high-purity deionized water by applying a positive potential to the gallium arsenide wafer with respect to the rinse water.

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**3,673,065**

**ELECTROLYTIC REMOVAL OF GREASY MATTER FROM AQUEOUS WASTES**

Harry T. Anderson, 208 Eastern Ave., Clarendon Hills, Ill., assignor to Swift & Company, Chicago, Ill.

Filed April 8, 1970, Ser. No. 26,769
Int. Cl. C02b *1/82;* B01k *3/04*
U.S. Cl. 204—149 8 Claims

Fat-water emulsion systems are de-emulsified by impressing direct current electrical energy therethrough and positioned such that a carefully defined anolyte stream is formed. The anolyte stream, having low pH values, breaks the emulsion, enabling the fat to rise to the surface and to be skimmed off.

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**3,673,066**

**PROCESS FOR THE ACCELERATED OBTAINING OF TERPENIC OXIDES USING ULTRAVIOLET LIGHT**

Pierre Muller, Nanterre, France, assignor to Laboratories De L'Ozothine, Nanterre, France

Filed Feb. 14, 1969, Ser. No. 799,520
Int. Cl. B01j *1/10*
U.S. Cl. 204—162 R 2 Claims

A process for the preparation of verbenone, myrtenol, myrtenal, trans-verbenol, cis-verbenol, pinocarveol, 3.01–2 pinene, α-pinene epoxide and campholene aldehyde comprising

I. subjecting oil of turpentine to an intense oxidation step comprising continuously insufflating air through said oil at a temperature of about 70° C while agitating said oil and irradiating said oil with ultraviolet light in the presence of
   a. from 0.05 to 0.5 percent by weight of a promoter selected from the group consisting of organic salts and complexes of nickel, vanadium, tungsten, tantalum,

niobium, rhenium, tellurium and selenium; and

b. in the presence of from 1 to 10 percent by weight of at least one catalyst selected from the group consisting of

1. the abietates, the levopimarates, the dextropimarates and the pinonates of cobalt, manganese and nickel; and

2. a member selected from the group consisting of the acetylacetonates, the phthalocyanines and the terpenic acid salts of nickel, cobalt, vanadium, tungsten, tantalum, niobium and rhenium; the oxides of selenium and tellurium; the naphthenates, the oleates, and the stearates of cobalt, manganese and nickel; in the presence of from 0.05 to 0.5 percent by weight of at least one member selected from the group consisting of copper (II) salts, cesium salts and mixtures thereof;

II. distilling off the reaction products having a boiling point of about 75° C at 10 mmHg; and

III. rectifying the distilled reaction products collected, is disclosed.

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**3,673,067**

**REMOVAL OF MOLECULAR HALOGEN FROM SOLUTION BY PASSAGE THROUGH A MEMBRANE**

**William H. Harwood, Lawton, and William P. Banks, Ponca City, both of Okla., assignors to Continental Oil Company, Ponca City, Okla.**

**Filed Nov. 23, 1970, Ser. No. 92,301**
**Int. Cl. B01d *13/02***
**U.S. Cl. 204—180 P** **9 Claims**

A method for removing molecules of a halogen from a solution thereof by passing the molecules into or through a membrane of polyolefinic material. The halogen molecules enter and become dissolved in the material of the polyolefinic membrane, and may be transferred through the membrane by imposing a concentration gradient across the membrane between solutions on opposite sides thereof, or, in some instances, by applying an electromotive force.

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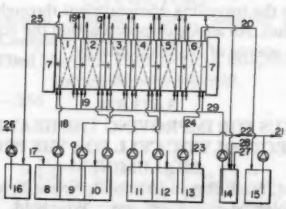
**3,673,068**

**PROCESS FOR RECOVERING WASTE ACIDS AND METALS BY ELECTRODIALYSIS**

**Maomi Seko, Tokyo; Akira Yomiyama, Nobeoka-shi; Tetsuya Miyake, Nobeoka-shi, and Hidemaro Iwashita, Nobeoka-shi, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Kita-ku, Osaka, Japan**

**Filed Dec. 12, 1969, Ser. No. 884,555**
**Claims priority, application Japan, Dec. 16, 1968, 43/91560**
**Int. Cl. B01d *13/02***
**U.S. Cl. 204—180 P** **5 Claims**



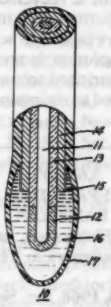
A process for recovering a substantial portion of nitric acid and metal ions from an acidic waste liquid produced in the process for the production of adipic acid by oxidizing cyclohexanone or cyclohexanol in a liquid phase, which comprises supplying said waste liquid to an electrodialysis apparatus including one or more electrodializers to recover said nitric acid and metal ions in a recovering liquid of a member selected from water and a diluted aqueous nitric acid.

**3,673,069**

**CARBON DIOXIDE SENSOR**

**Leonard W. Niedrach, and William H. Stoddard, Jr., both of Schenectady, N.Y., assignors to General Electric Company**

**Filed May 3, 1971, Ser. No. 139,674**
**Int. Cl. G01n *27/36, 27/46***
**U.S. Cl. 204—195 G** **6 Claims**



A carbon dioxide sensor has a first electronically conductive metallic base member, an electrochemically active region of a continuous glaze of pH sensing glass in electrical contact with a portion of the base member, a second electronically conductive metallic base member, a second electrochemically active region of silver and silver halide in electrical contact with the second base member, a first layer of electrical insulation disposed between the first and second base members, a second layer of electrical insulation disposed over the second base member, an immobilized electrolyte contacting both electrochemically active regions, and an outer sheath of carbon dioxide permeable, ion-impermeable diffusion barrier material encapsulating at least the electrochemically active regions and the electrolyte.

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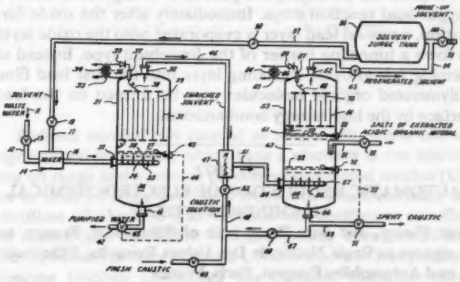
**3,673,070**

**PROCESS FOR REMOVING AND CONCENTRATING ACIDIC ORGANIC MATERIAL FROM WATER**

**Robert A. Wiley, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.**

**Filed June 22, 1970, Ser. No. 48,367**
**Int. Cl. B03c *5/00*; C10g *17/00, 31/14***
**U.S. Cl. 204—186** **16 Claims**



A process for removing and concentrating acidic organic material from a water stream. The water stream is dispersed within an organic liquid solvent for removing substantial amounts of acidic organic material, such as phenol, mercaptans and thiophenols etc., from the water. The enriched organic solvent phase is separated from the purified water stream phase. Next, the enriched solvent is intimately con-

tacted with substantially stoichiometric amounts of an immiscible concentrated caustic solution forming a three phase mixture in a second dispersion. This three phase liquid mixture is separated into a regenerated solvent phase, a second liquid phase of the alkali-metal salts of extracted acidic organic material, and a third phase of excess caustic solution. Preferably, both phase separations are undertaken in the presence of an electric field.

The regenerated solvent is recycled into contact with the water stream; the high-purity alkali-metal salts of extracted acidic organic material are passed to some suitable utilization, and the excess caustic solution is recycled for regenerating further amounts of the enriched solvent. Only small amounts of caustic need to be added to maintain a circulating inventory of the caustic solution.

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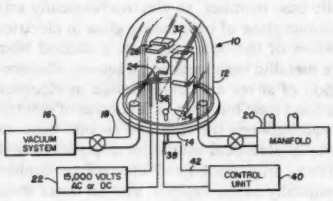
**3,673,071**

## PROCESS FOR PREPARATION OF TUNNELING BARRIERS

**John P. Pritchard, Jr., Richardson, and Walter H. Schroen, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Aug. 8, 1968, Ser. No. 751,229**
**Int. Cl. C23c *15/00***
**U.S. Cl. 204—192** **10 Claims**




Tunneling barriers, in particular superconductive tunneling barriers (Josephson barriers), are prepared in a vacuum chamber maintained at a low atmospheric pressure using an oxygen glow discharge which produces stable and reproducible superconductive tunneling devices. To prepare a Pb—$Pb_xO_y$—Pb barrier the first lead film is placed in a vacuum chamber and charged to a negative potential with regard to the positive ions by fast electrons from the plasma charge. Oxygen gas molecules bombard the first lead film where they probably disassociate into two oxygen atoms. A surface reaction takes place which produces a lead-oxide insulating layer in the first lead film. After this lead-oxide layer has reached a predetermined thickness, the plasma is extinguished and the oxygen-lead reaction stops. Immediately after the oxide formation, a second lead layer is evaporated onto the oxide layer to form a tunneling barrier of the Josephson type. Instead of forming a lead-oxide insulating layer into the first lead film, polymerized organic molecules may be formed on the lead surface by the high energy bombardment.

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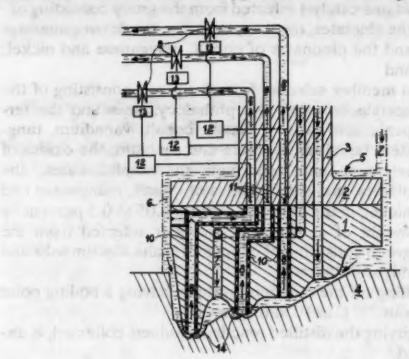
**3,673,072**

## AUTOMATIC REGULATION OF ELECTROCHEMICAL MACHINING SYSTEMS

**Jean Fleury, and Jean Pinot, both of Billancourt, France, assignors to Regie Nationale Des Usines Renaults, Billancourt and Automobiles Peugeot, Paris, France**

**Filed Feb. 16, 1971, Ser. No. 115,426**
**Claims priority, application France, Feb. 18, 1970, 7005750**
**Int. Cl. B23p *1/02*; B01k *3/04***
**U.S. Cl. 204—224** **7 Claims**

This device for the automatic regulation of electrochemical machining processes is adapted to modify machining conditions according to the nature of the surface being machined and the rate of tool feed. It comprises temperature measuring means inserted in each electrolyte discharge conduit and adapted to control through servo means the output adjustment members. This device is applicable to the regulation of



machining conditions by varying the return electrolyte output in machines of the type comprising an electrolyte-filled chamber under pressure.

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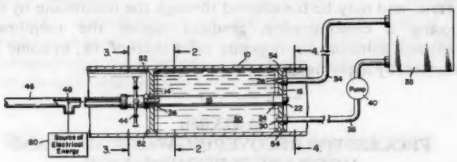
**3,673,073**

## APPARATUS FOR ELECTROPLATING THE INTERIOR OF AN ELONGATED PIPE

**Ray Tobey, and David L. Lankford, both of Tulsa, Okla., assignors to Automation Industries, Inc., Century City, Calif.**

**Filed Oct. 7, 1970, Ser. No. 78,900**
**Int. Cl. C23b *5/56*; B23p *1/02*; B01k *3/00***
**U.S. Cl. 204—226** **1 Claim**




Herein described is an apparatus and a method for plating a uniform thickness of material upon a substrate. The disclosed apparatus and method is particularly adapted for electroplating the inside diameter of a hollow member. A travelling compartment is included with is adapted to traverse the inside of the member to be plated. The compartment has an inlet and an outlet port. A source of electroplating solution includes a first conduit coupled between the source to the inlet port and a second conduit coupled between the source and the outlet port. Means are included for circulating the electroplating solution into the travelling compartment through the first and second conduit. An anode disposed within the compartment is coupled to a source of electrical energy.

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**3,673,074**

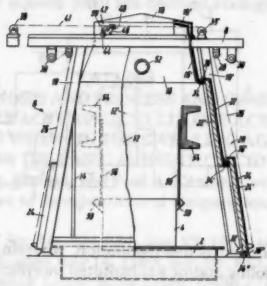
## APPARATUS FOR IMPROVING THE HEAT ECONOMY OF AN ELECTROLYTIC CELL FOR THE PRODUCTION OF ALUMINUM

**Wilhelm Hirt, Norf; Hagen Lehnerdt, Neuss; Ernst Weckesser, Grevenbroich/Nhr.; Gottfried Weinhold, Norf, and Friedrich Eilhelm Wrigge, Bad Godesberg, all of Germany, assignors to Vereingte Aluminum-Werke, Aktiengesellschaft, Bonn, Germany**

**Filed April 9, 1969, Ser. No. 814,592**
**Claims priority, application Germany, April 10, 1968, P 17 58 149.6**
**Int. Cl. C22d *3/02, 3/12***
**U.S. Cl. 204—243 R** **8 Claims**

Method and apparatus for improving the heat economy of electrloytic cells for the production of aluminum, in which a

sealed housing is provided above the bath of the cell and about the anode extending thereinto to maintain about an anode



portion above the bath in said housing a volume of confined air, thereby reducing heat loss to the outer atmosphere.

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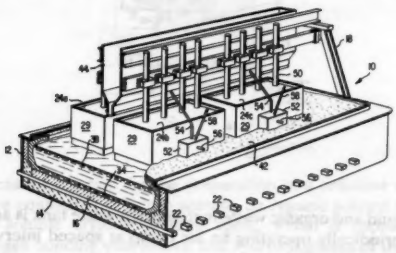
**3,673,075**

## ALUMINA REDUCTION SYSTEM

**Robert M. Kibby, Florence, Ala., assignor to Reynolds Metals Company, Richmond, Va.**

**Filed April 24, 1970, Ser. No. 31,591**
**Int. Cl. C22d *3/02, 3/12***
**U.S. Cl. 204—245** **9 Claims**



Improved techniques in the operation of alumina reduction cells, particularly as regards procedures and equipment for feeding alumina into the bath of such a cell and for collecting and removing anode reaction gases; and reduction cells of improved design and construction.

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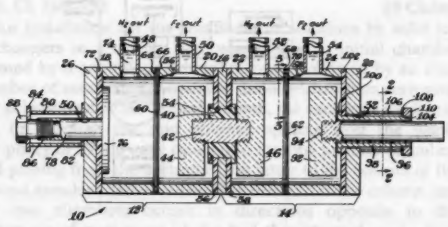
**3,673,076**

## FILTER PRESS FLUORINE CELL WITH CARBON CONNECTORS

**Paul R. Juckniess, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Filed March 5, 1969, Ser. No. 804,396**
**Int. Cl. B01k *3/10, 1/00***
**U.S. Cl. 204—256** **4 Claims**



This invention relates to a filter press type of cell wherein the connection of an anode to the cathode of an adjacent cell is through a carbon connector. Individual cells have their ends protected by a Teflon end cover plate. The carbon connector between cells passes, by means of a press fit, through a Teflon bushing. A metal diaphragm fits across each cell intermediate its ends, the diaphragms being insulated from the adjacent metal body of the cell by Teflon gaskets.

The cell bath fills the cells and extends into hydrogen and fluorine risers at the top of each cell.

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**3,673,077**

## PROCESS FOR PRODUCING ELECTRODE BINDER PITCH AND CARBON BLACK FEEDSTOCK

**Abraham Gerrit Alexander Roza, Amsterdam, Netherlands, assignor to Shell Oil Company, New York, N.Y.**

**Filed Sept. 29, 1969, Ser. No. 862,025**
**Claims priority, application Great Britain, Oct. 3, 1968, 46,915/68**
**Int. Cl. C10c *3/04*; C10g *37/04, 37/08***
**U.S. Cl. 208—76** **13 Claims**

There is disclosed a process for converting the residue portion of a cracked petroleum product into electrode binder pitch and carbon black feedstock, both more valuable products, by heat soaking the residue to produce electrode binder pitch and a middle distillate, and blending the middle distillate with some of the electrode binder pitch to produce a carbon black feedstock.

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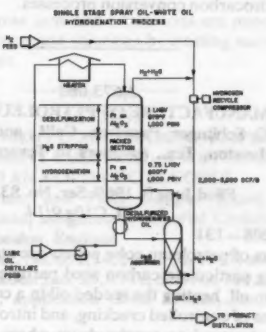
**3,673,078**

## PROCESS FOR PRODUCING HIGH UR OIL BY HYDROGENATION OF DEWAXED RAFFINATE

**Merritt C. Kirk, Jr., Thornton, Pa., assignor to Sun Oil Company, Philadelphia, Pa.**

**Filed March 4, 1970, Ser. No. 16,495**
**Int. Cl. C10g *23/04***
**U.S. Cl. 208—89** **7 Claims**




Refined mineral oils (useful as textile oils, white oils and agricultural spray oils) which have a viscosity in the lubricating oil range and a volume percent unsulfonated residue (UR) of at least 94.5 are produced from a dewaxed raffinate of a distillate oil obtained from a crude oil classified as paraffinic or mixed-base by ASTM viscosity-gravity constant (VGC), the dewaxed raffinate having a UR less than 93. The preferred process involves contacting the dewaxed raffinate with a hydrogen rich gas and a catalytic amount of sulfur-resistant hydrogenation catalyst at a temperature of about 550° to 750° F., a pressure of at least 1,500 p.s.i.g., and a hydrogen feed rate of about 0 to 10,000 s.c.f./bbl. of feed, at a gas recycle in the range of 0–20,000 s.c.f./bbl. of feed, said contacting being at a liquid hourly space velocity sufficient to convert said dewaxed raffinate to a hydrogenated oil having a UR of at least 94.5. At 0 or low gas recycle the preferred catalysts comprise sulfided oxides of nickel and molybdenum. When the gas

recycle is at least 500 s.c.f. the preferred catalysts also include nickel and the noble metal hydrogenation catalysts (e.g. Pt, Pd, Ru, Rh, Re) and alloys of 2 or more noble metals (e.g. PdRu, PtRe, PtRh, etc.). In one preferred embodiment the contacting is in two or more stages or zones. In the first stage or zone the catalyst is substantially sulfur resistant (e.g. sulfided CoMo, NiMo, NiCoMo, PtS) under the reaction conditions and the product has less than 10 p.p.m. sulfur. In the second stage or zone, the low sulfur product of the first stage or zone is contacted with a more active catalyst for saturation of aromatic rings (e.g. Pt, Pd, Ni, Rh, Re, Rh).

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**3,673,079**

## CATALYST MANUFACTURE

**Bernard F. Mulaskey, Pinole, and Elmore F. Chilton, El Cerrito, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.**

**Continuation-in-part of Ser. No. 632,559, April 21, 1967, abandoned. This application Jan. 21, 1970, Ser. No. 4,735**

**Int. Cl. C10g *13/02***

**U.S. Cl. 208—111** **15 Claims**

Multicomponent catalysts are produced, for example, in the form of rod-like particles, by forming a slurry of gelatinous precipitates of compounds of elements for forming the desired catalyst components, in a strongly ionic aqueous medium, separating the gelatinous precipitates from the slurry without washing, partially drying the unwashed gelatinous precipitates in the form of subdivided cohesive particles to a controlled moisture content, recombining the partially dried cohesive particles and extruding to form extrudate rods, washing the extrudate rods until essentially free of contaminating ions present in the occluded ionic aqueous medium, and thereafter drying and calcining the washed extrudate rods. Catalysts with a variety of different compositions can be prepared by this same general procedure and can be used in appropriate different hydrocarbon conversion processes.

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**3,673,080**

## MANUFACTURE OF PETROLEUM COKE

**Warren G. Schlinger, Pasadena, Calif., and Harold C. Kaufman, Houston, Tex., assignors to Texaco Inc., New York, N.Y.**

**Filed June 9, 1969, Ser. No. 831,548**

**Int. Cl. C10g *9/14***

**U.S. Cl. 208—131** **3 Claims**

Clusters of petroleum coke pellets are made by the steps of dispersing particulate carbon seed particles in a high boiling petroleum oil, heating the seeded oil in a coking heater under conditions of controlled cracking, and introducing the effluent from the heater into a coke drum where the seed particles serve as nucleating agents in the formation of clusters of petroleum coke pellets.

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**3,673,081**

## PROCESS FOR SEPARATING SATURATED HYDROCARBONS AND OLEFINS

**Gerhard Preusser, Essen; Martin Schulze, Neviges, and Klaus Richter, Essen, all of Germany, assignors to Heinrich Koppers Gesellschaft mit beschrankter Haftung, Essen, Germany**

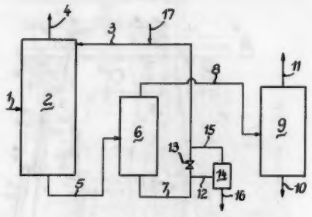
**Filed Feb. 18, 1970, Ser. No. 12,190**

**Claims priority, application Germany, Feb. 19, 1967, P 19 08 126.6**

**Int. Cl. C10g *21/20***

**U.S. Cl. 208—313** **10 Claims**

Process for separating saturated hydrocarbons and olefins from mixtures thereof, by subjecting such a mixture to an extractive distillation in the presence of a solvent selective for the olefins, whereby the solvent containing the separated olefin dissolved therein is subjected to a further distillation for separating the olefin from the solvent and the latter recycled



back into the extractive distillation, wherein as selective solvent morpholine and/or a substituted morpholine is used.

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**3,673,082**

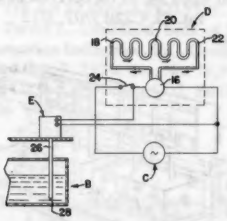
## APPARATUS AND METHOD FOR AERATING WASTE MATERIAL

**James S. Reid, Hudson, Ohio, assignor to The Standard Products Company, Cleveland, Ohio**

**Filed April 26, 1971, Ser. No. 137,129**

**Int. Cl. C02c *1/02***

**U.S. Cl. 210—12** **5 Claims**



Liquid and organic waste material in a waste tank is aerated by periodically operating an air pump at spaced intervals of time.

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**3,673,083**

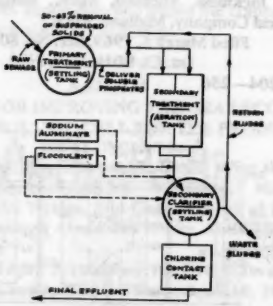
## SEWAGE TREATMENT

**Roy D. Sawyer, Toledo, and John D. Tinsley, Lima, both of Ohio, assignors to Nalco Chemical Company, Chicago, Ill.**

**Continuation-in-part of Ser. No. 823,518, May 9, 1969, abandoned. This application Dec. 28, 1970, Ser. No. 101,762**

**Int. Cl. C02c *1/40***

**U.S. Cl. 210—18** **3 Claims**




Soluble phosphates are removed from a sewage effluent by controlled additions of sodium aluminate, $NaAlO_2$, and a floc-

culant introduced into the sewage effluent at some point after secondary (aeration) treatment and prior to discharging the effluent to a receiving body of water, thereby reducing considerably the amount of phosphates responsible for proliferation of primitive aquatic plant life deemed ecologically inimical.

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**3,673,084**

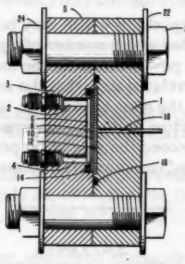
## REVERSE OSMOSIS AND PROCESS AND COMPOSITION FOR MANUFACTURING CELLULOSE ACETATE MEMBRANES WHEREIN THE SWELLING AGENT IS A DI-OR TRI-BASIC ALIPHATIC ACID

**William M. King, Walnut, and Paul A. Cantor, Covina, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.**

**Continuation of Ser. No. 521,034, Jan. 17, 1966, abandoned. This application July 14, 1969, Ser. No. 847,496**

**Int. Cl. B01d** *13/04;* **B29d** *27/04;* **C08b** *27/44*

**U.S. Cl. 210—23** **12 Claims**



A casting solution for the preparation of a cellulose membrance containing cellulose acetate, an organic solvent and a water-soluble organic swelling agent, which is capable of hydrogen bonding with ketone and hydroxyl groups of the cellulose acetate, said organic swelling agent being present in an amount between about 1.0 to about 10 parts by weight of each 10 parts of the cellulose acetate, said organic swelling agent being of a different composition than the organic solvent and being, for example, a di- or a tri-basic aliphatic acid having from two to 13 carbon atoms.

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**3,673,085**

## METHOD AND APPARATUS FOR TREATING SOLUTIONS BY SOLID-ION EXCHANGERS

**Paul Minart, Grenoble, France, assignor to Societe Grenobloise d'Etudes et d'Applications Hydrauliques, (Sogreah), Grenoble, France**

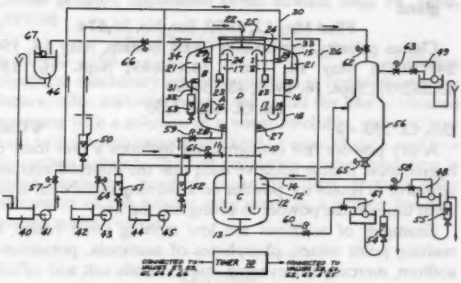
**Filed Nov. 19, 1969, Ser. No. 878,013**

**Claims priority, application France, Nov. 21, 1968, 685293**

**Int. Cl. B01d** *15/02*

**U.S. Cl. 210—33** **10 Claims**

An installation for the treatment of solutions by solid ion exchangers in a mobile bed, comprising an initial chamber formed by a central cylindrical column, followed by an even number of successive concentric annular chambers surrounding at least part of the central column, the exchange media rising up through the said column, spilling over the whole periphery of its top edge down into the first annular chamber, and passing from the bottom of the latter to the bottom of the second annular chamber. The flow of liquid in the column and the two chambers occurs in directions opposite to the directions of movement of the bed therethrough and whenever two liquids of different densities are present in the same chamber, the denser liquid is below the lighter liquid and is separated therefrom by an interface. The inlet and outlet flow rates of each liquid are controlled to keep the movements of



an interface between certain limits during the operation of the installation.

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**3,673,086**

## METHOD OF REMOVING NITRIC ACID, NITRATE IONS AND NITRITE IONS OUT OF AQUEOUS WASTE SOLUTIONS

**Stephan Drobnik, Eggenstein, Germany, assignor to Gesellschaft Fur Kernforschung mbH, Weberstrasse, Karlsruhe, Germany**

**Filed July 8, 1970, Ser. No. 53,283**

**Claims priority, application Germany, July 11, 1969, P 19 35 273.9**

**Int. Cl. C02c** *5/02*

**U.S. Cl. 210—59** **10 Claims**

Nitric acid, nitrate ions and nitrite ions are removed from aqueous radioactive waste solutions by treating such solutions with reducing agent.

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**3,673,087**

## PLANT TREATMENT COMPOSITION COMPRISING A PLANT TREATMENT CHEMICAL, A WETTING AGENT AND AN ALIPHATIC ALCOHOL

**Robert Coles Brian, and Peter Douglas Bland, both of Bracknell, England, assignors to Imperial Chemical Industries Limited, London, England**

**Continuation of Ser. No. 691,143, Dec. 18, 1967, abandoned. This application Jan. 25, 1971, Ser. No. 109,636**

**Claims priority, application Great Britain, Jan. 5, 1967, 672/67**

**Int. Cl. A01n** *17/08;* **C09k** *3/00*

**U.S. Cl. 252—1** **17 Claims**

Plant treatment compositions having improved wetting and spreading properties, containing a plant treatment chemical, a wetting agent selected from alkyl or alkyl aryl sulphonates or sulphates, or from condensates of ethylene oxide or propylene oxide with alcohols, amines or alkyl phenols; and an aliphatic compound having the molecular formula:

$$R^1\text{—}\underset{\displaystyle X}{\underset{|}{C}}H\text{—}R^1$$

wherein X is —OH, —$CO_2H$, —$NH_2$, —$CONH_2$, or —O·CO·H, and wherein $R^1$ is a straight chain alkyl or alkoxyalkyl group having from four to 11 carbon atoms; $R^2$ is hydrogen or a straight chain alkyl or alkoxyalkyl group having from three to five carbon atoms and the total number of carbon atoms in the molecule is from 8 to 12 inclusive.

3,673,088

## FIRE EXTINGUISHING POWDERS COMPRISING A CELLULOSE ETHER ADDITIVE

Henry George Clements, Liverpool, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed May 12, 1970, Ser. No. 36,674

Claims priority, application Great Britain, May 14, 1969, 24,479/69; May 14, 1969, 24,480/69; Sept. 16, 1969, 45,555/69; Sept. 16, 1969, 45,556/69

Int. Cl. A62d *1/00*

U.S. Cl. 252—2 6 Claims

A dry powder fire extinguishant includes a non toxic non hygroscopic fusible additive such that the material acts as an adhesive to retain the powder on a burning surface for a sufficient time for the powder to extinguish the fire.

Examples of additives are low melting point resins, low melting point waxes, phosphates of ammonia, potassium or sodium, mercury thiocyanate, microcosmic salt and cellulose ethers of low melting point.

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3,673,089

## METHYL ALKYL SILICONE GREASE COMPOSITION AND METHOD OF MAKING SAME

John G. Wright, Elnora, N.Y., assignor to General Electric Company

Continuation-in-part of Ser. No. 762,322, Sept. 16, 1968, Pat. No. 3,537,997. This application April 6, 1970, Ser. No. 26,153

Int. Cl. C10m *7/50, 7/20*

U.S. Cl. 252—42.1 5 Claims

A grease composition contains a polysiloxane, the organic substituents of which are primarily methyl radicals and $C_6$ to $C_{12}$ alkyl radicals, a thickener, optionally an amount of a polyether which is sufficient to cause the thickener to disperse into the polysiloxane, but insufficient to deleteriously affect the high temperature properties of the grease, and optionally a sufficient amount of a base to render the grease alkaline. The grease is made by heating together the polysiloxane, the polyether, the thickener and the base to a temperature of about 400°–500° F. after which the grease composition is cooled to room temperature, then milled. The grease composition is used in windshield wiper bearings and drive mechanisms, which are subject to oscillatory motion, often while being flooded with water.

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3,673,090

## SULFURIZATION OF TRIISOBUTYLENE AND PRODUCTS RESULTING THEREFROM

James O. Waldbillig, Beacon; Morris A. Wiley, Fishkill; Marvin L. Rambo, Fishkill, and Alfred J. Millendorf, Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed June 11, 1970, Ser. No. 45,542

Int. Cl. C10m *1/38*

U.S. Cl. 252—45 3 Claims

A process for the sulfurization of triisobutylene and resulting products comprising contacting triisobutylene with sulfur under essentially atmospheric conditions at a temperature between about 360° and 500°F., utilizing a mole ratio of triisobutylene to sulfur of between about 1:4 and 1:2.5 while blowing the reaction mixture during at least a part of said contacting with an inert gas and recovering a sulfurized triisobutylene product containing as a major component a compound of the empirical formula $C_{12}H_{20}S_3$ having substantially reduced corrosive activity to copper coupled with superior EP (extreme pressure) improving properties when incorporated in hydrocarbon lubricating oils such as gear oils and cutting oils.

3,673,091

## LUBRICANTS CONTAINING OXIDATION INHIBITORS

William F. Werzner, Wood River, Ill., and James R. Miller, Florissant, Mo., assignors to Shell Oil Company, New York, N.Y.

Filed July 16, 1970, Ser. No. 55,607

Int. Cl. C10m *1/32*

U.S. Cl. 252—51.5 R 8 Claims

Novel compounds resulting from the reaction of hindered phenols, such as 3,5-di-t-butyl-4-hydroxybenxyl alcohol, with various aryl amines or carbazole are effective oxidation inhibitors for lubricants.

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3,673,092

## MULTILAYER DIELECTRIC COMPOSITIONS COMPRISING LEAD-BARIUM BOROSILICATE GLASS AND CERAMIC POWDER

Raymond Louis Dietz, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed June 5, 1970, Ser. No. 43,910

Int. Cl. C04b *33/00;* H01g *1/00*

U.S. Cl. 252—520 6 Claims

A dielectric composition which may be used in multilayer dielectrics is provided which consists of a glass binder and particles of a ceramic powder wherein the amounts of these two ingredients are correlated such that the ceramic powder substantially saturates the glass binder so as to insure the solderability of the conductors in the multilayered structure but does not substantially exceed the saturation point so as to cause a porous or non-sealed structure to be formed.

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3,673,093

## LIQUID DIELECTRIC COMPOSITION OF ALKYL BENZENE AND AN ANTIOXIDATION STABILIZER

Aldo Rocchi, Mantova, Italy, assignor to Montecatini Edison S.p.A., Milan, Italy

Filed May 29, 1967, Ser. No. 642,233

Claims priority, application Italy, June 3, 1967, 18650

Int. Cl. H01b *3/22*

U.S. Cl. 252—63.7 4 Claims

A liquid composition having high dielectric strength and oxidation resistance for use as a transformer oil and for other purposes in which an electrically insulating liquid is required, the composition consisting essentially of an alkylaryl hydrocarbon (i.e., dodecylbenzene) and 10 to 1,000 parts per million (ppm) of an antioxidizer from the group of phenolic and naphtholic compounds and their nuclear-substitution products, especially alkyl-substituted cresols, phenols and aminophenols, preferably di-tertiarybutyl-paracresol and 2,4-dimethyl-6-tertiarybutylphenol. The basic hydrocarbon is preferably the alkylbenzene obtained by alkylation of benzene with alkyl groups derived from polymerization of propylene (i.e., propylene tetramer).

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3,673,094

## CHEMICAL MILLING METHOD AND BATH FOR STEEL

John F. Kreml, Phoenix, Md., assignor to Armco Steel Corporation, Middletown, Ohio

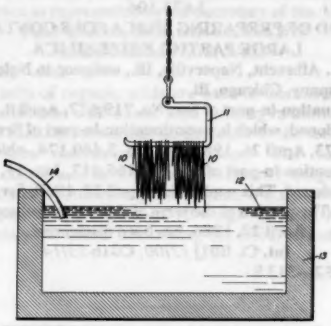
Filed July 7, 1969, Ser. No. 839,675

Int. Cl. C23g *1/04, 1/08*

U.S. Cl. 252—79.4 12 Claims

Chemical milling of stainless steel and high nickel alloys by immersing the same in a bath of 3 to 15 percent by volume sulphuric acid, 3 to 15 percent hydrochloric acid, 2 to 6 percent nitric acid, 0.1 to 5 percent lignin, more particularly a vegetable tannin, as an inhibitor, and remainder water; and maintaining the steel or alloy in the bath at such temperature and for such time as to remove a desired quantity of metal. A best combination of results is had with the extract of the bark

of Acacia Mollissima serving as the inhibitor. In milling martensitic and ferritic stainless steel, the bath additionally may



contain phosphoric acid. And in milling austenitic stainless steel, the bath additionally may contain hydrofluoric acid.

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**3,673,095**

**OIL AND GREASE ABSORBING COMPOSITION COMPRISING SPHAGNUM MOSS, CALCINED GYPSUM AND PERLITE**

**Ralph H. Archer, 6429 S. W. 36th St., Portland, Oreg.**

**Filed July 20, 1970, Ser. No. 56,736**

**Int. Cl. C09k *3/22*; B01j *1/22***

**U.S. Cl. 252—88** **5 Claims**

An oil and grease absorbent composition contains comminuted sphagnum moss as a major ingredient and, as a minor ingredient, a sufficient amount of powdered calcined gypsum to render the mixture fire resistant. A minor amount of a lightweight friction material is also desirably added. A preferred composition is approximately 12 parts by volume of comminuted sphagnum moss and approximately 1 part each by volume of powdered calcined gypsum and heat expanded perlite.

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**3,673,096**

**PROTEIN SOLUBILIZING WASHING RINSING AND SOAKING COMPOSITIONS**

**Dieter Walter, Hilden; Walter Fries, Erkrath-Unterbach, and Ernst Gotte, Ratingen-Tiefenbroich, all of Germany, assignors to Henkel & Cie GmbH, Henkelstrasse, Dusseldorf, Germany**

**Filed Aug. 27, 1969, Ser. No. 853,498**

**Claims priority, application Germany, Sept. 26, 1968, P 17 92 617.9**

**Int. Cl. C11d *3/34***

**U.S. Cl. 252—89** **3 Claims**

A composition for washing, rinsing and soaking comprising (a) a content of at least one compound selected from the group consisting of dialkyldisulfimides and their alkali metal salts, ammonium salts and organic amine salts, wherein the alkyl groups have from 6 to 10 carbon atoms and (b) a content of at least one compound selected from the group consisting of alkali metal and ammonium polyphosphates, alkali metal silicates and alkali metal and ammonium salts of aminopolycarboxylic acids and polyphosphonic acids, wherein said components (a) and (b) are present in amounts of from 0.5:99.5 to 1:3 by weight. These compositions are useful in solubilizing proteinaceous soil when used alone or in combination with other washing agent additives.

**3,673,097**

**CLEANING COMPOSITIONS**

**Harry Clarence De Vroome, London, England, assignor to Ayrodev Processes Limited, Poplar, England**

**Filed Feb. 24, 1969, Ser. No. 801,778**

**Claims priority, application Great Britain, Aug. 14, 1968, 38,797/68**

**Int. Cl. C11d *1/38, 3/26***

**U.S. Cl. 252—153** **5 Claims**

Electrical machinery whose insulation is contaminated by moisture, salts, carbonaceous matter, and the like is cleaned by spraying with a solution of a water-insoluble, cationic surfactant with a hydroxy-aromatic acid or ester of such acid in a hydrocarbon solvent. The full resistance of the insulation is restored, and the residual protective film formed after volatilization of the solvent may serve as a primer for subsequently applied varnish.

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**3,673,098**

**DETERGENT COMPOSITION AND PROCESS**

**Philip M. Sabatelli, Cincinnati, Ohio, and Charles A. Brungs, Fort Wright, Ky., assignors to Chemed Corporation, Cincinnati, Ohio**

**Continuation-in-part of Ser. No. 680,966, Nov. 6, 1967, abandoned. This application July 22, 1970, Ser. No. 57,345**

**Int. Cl. C11d *7/06***

**U.S. Cl. 252—156** **3 Claims**

The invention disclosed is directed to a highly alkaline detergent composition having unexpectedly high tolerance with respect to hard water. The composition includes from about 10 to about 50 parts of an alkaline inorganic detergent component, from about 5 to about 30 parts of a tetra-alkali metal pyrophosphate component, from about 5 to about 30 parts of an alkali metal nitrilo triacetate component, from 0 to about 5 parts of a water-soluble nitrite component, and from 0 to about 5 parts of a low-foaming surfactant. The composition is low-foaming in use dilutions and highly effective for machine dishwashing with less spotting and greater clarity of articles cleaned therewith. Also disclosed is a process for washing articles for cooking and eating using dilute aqueous solutions of the composition.

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**3,673,099**

**PROCESS AND COMPOSITION FOR STRIPPING CURED RESINS FROM SUBSTRATES**

**William Joseph Corby, Allentown; Victor Charles Garbarini, and Malcolm Lunt White, both of Bethlehem, all of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.**

**Filed Oct. 19, 1970, Ser. No. 81,754**

**Int. Cl. C11d *7/06***

**U.S. Cl. 252—156** **7 Claims**

Cured resins, such as silicones or polyvinyl cinnamate are stripped from substrates by exposure to a mixture of N-methyl-2-pyrrolidone and a strong base, such as an alkyl or substituted alkyl ammonium hydroxide, to which may be added other compatible organic solvents such as ethylene glycol monoethyl ether.

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**3,673,100**

**LIQUID SCINTILLATOR COMPOSITIONS FOR GAMMA-RAY COUNTING**

**Royal H. Benson, Texas City, Tex., assignor to Monsanto Company, St. Louis, Mo.**

**Continuation-in-part of Ser. No. 720,451, April 11, 1968, Pat. No. 3,573,218. This application April 23, 1969, Ser. No. 818,784**

**Int. Cl. G01t *1/20*; C09k *1/00***

**U.S. Cl. 252—301.3 R** **10 Claims**

A scintillator composition and method for liquid scintillation detection and counting of gamma-rays, said composition comprising, (1) a scintillator solution comprised of an aro-

matic hydrocarbon solvent, a scintillation solute and an ethoxylated alkyl phenol and, (2) a loading agent comprised of an aqueous solution of a compound of an element having an atomic number greater than twenty.

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3,673,101

## PROCESS FOR PREPARING IMPROVED CARBIDE MICROSPHERES FROM ION EXCHANGE RESINS

Robert Lee McKenney, Jr., Silver Spring, and Jacob Block, Rockville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Dec. 8, 1969, Ser. No. 883,298
Int. Cl. C09k *3/00*
U.S. Cl. 252—301.1 R 4 Claims

A process for controlling the amount of sulfur in metal carbide plus carbon microspheres made from ion exchange resins in which the microspheres are desulfurized by heating under hydrogen, hydrogen plus water or carbon monoxide plus water, at temperatures of 500–900° C. for times of 3 to 25 hours.

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3,673,102

## CATHODOLUMINESCENT CALCIUM SULFIDE COMPOSITIONS WITH IMPROVED FAST DECAY CHARACTERISTIC

Willi Lehmann, Murrysville, and Frederick M. Ryan, New Alexandria, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 29, 1970, Ser. No. 76,400
Int. Cl. C09k *1/12*
U.S. Cl. 252—301.4 S 8 Claims

The selected calcium sulfide cathodoluminescent materials which exhibit an inherent rapid decay characteristic after cathodoluminescent excitation exhibit an even faster decay characteristic when a predetermined amount of cobalt is incorporated into the composition. The amount of cobalt is preferably from about 0.001 gram-atom percent to one gram-atom percent taken with respect to the moles of calcium sulfide, with the energy efficiency of luminescence and the length of the time of phosphorescence decreasing with increasing cobalt content.

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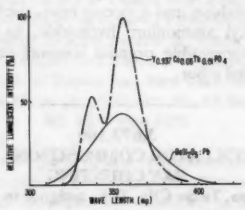
3,673,103

## YTTRIUM ORTHOPHOSPHATE PHOSPHOR

Kenzo Awazu; Kazu Matsunaga; Katsutoshi Muto; Junjiro Kai, and Kyoko Oi, all of Amagasaki-shi, Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1969, Ser. No. 854,187
Claims priority, application Japan, Aug. 31, 1968, 43/62441
Int. Cl. C09k *3/00*
U.S. Cl. 252—301.1 L 7 Claims




A phosphor consisting of yttrium phosphate as a matrix and cerium and thorium as an activator, represented by the general formula $Y1_{-x-y/3}Ce_xTh_yPO_4$ wherein $x$ is 0.01–0.1 mol and $y$ is 0.0002–0.05 mol. This phosphor gives a particularly strong luminescence in the near UV wavelength zone of 330–370 millimicrons, and has a light output about 1.5 times as high as a lead-activated barium disilicate ($BaSi_2O_5$:Pb), the light output decrease during light production being markedly small.

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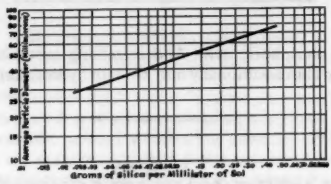
3,673,104

## METHOD OF PREPARING SILICA SOLS CONTAINING LARGE PARTICLE SIZE SILICA

William L. Albrecht, Naperville, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

Continuation-in-part of Ser. No. 719,677, April 8, 1968, abandoned, which is a continuation-in-part of Ser. No. 453,873, April 26, 1965, Pat. No. 3,440,174, which is a continuation-in-part of Ser. No. 165,617, Jan. 11, 1962, abandoned. This application April 28, 1969, Ser. No. 819,861The portion of the term of this patent subsequent to April 22, 1986, has been disclaimed.
Int. Cl. B01j *13/00*; C01b *33/14*
U.S. Cl. 252—313 S 3 Claims




Method for preparing aqueous stable silica sols containing at least 40 percent by weight of silica in the form of large, discrete, spherical particles having a weight-average particle diameter of from 45 to 100 millimicrons. An aqueous acid silica sol feed is added at a critical maximum feed rate to an aqueous alkaline silica sol containing particles having a weight-average diameter of from about 10 to 30 millimicrons while the aqueous liquid phase thereof is continuously evaporated. The pH of the alkaline sol during the whole of the addition is maintained at a value of at least 7.0.

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3,673,105

## DEFOAMER COMPOSITIONS FOR AQUEOUS SYSTEMS

James H. Curtis, Columbia, S.C., and Fred E. Woodward, Watchung, N.J., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed April 11, 1969, Ser. No. 815,498
Int. Cl. B01d *17/00*
U.S. Cl. 252—321 6 Claims

Defoamer compositions and method of defoaming aqueous systems such as latex or paper and pulp systems, for example, compositions being composed of certain fatty amides, inorganic particles (talc, for example), hydrocarbon liquid, an oil soluble polymer and a silicone oil.

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3,673,106

## EMULSIFIER SYSTEM

John J. Jonas, Winnetka, and Ernest H. Freund, Evanston, both of Ill., assignors to Kraftco Corporation, New York, N.Y.

Filed June 18, 1969, Ser. No. 834,500
Int. Cl. B01f *17/34*
U.S. Cl. 252—356 15 Claims

An emulsifier system is described for various products and particularly for food products which desirably incorporate air such as foams. The emulsifier system comprises, in combination, fatty monoesters of polyhydric alcohols stabilized in the alpha crystalline form by a crystal transition inhibitor. The monoesters include glycerol monoesters and 1.2 propylene glycol monoesters. The transition inhibitor is a non-surface active salt compound comprising atoms having strong electronegative charge.

3,673,107

## MIXED FIELD RADIATION DOSIMETER MATERIALS OF AMINE SALTS OF ORGANIC ACIDS

Ignatius G. Peters, Devine, Tex., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Dec. 18, 1969, Ser. No. 886,373
Int. Cl. G01n *27/78, 31/22*
U.S. Cl. 252—408 2 Claims

Amine salts of organic acids are used as dosimeter materials. The salts react with mixed field ionizing radiation to form stable free radicals which may be detected by the technique of electron spin resonance spectroscopy. The salts have hydrogen contents of from about 9 to about 11 weight percent and thus react with ionizing radiation in a manner similar to human tissue which has about 10 weight percent hydrogen. The materials are useful in studying the effect of radiation on tissue.

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3,673,108

## HYDROCRACKING CATALYST ACTIVATION TREATMENT

Hans U. Schutt, Lafayette, Calif., assignor to Shell Oil Company, New York, N.Y.

Filed Dec. 31, 1969, Ser. No. 889,681
Int. Cl. B01j *11/02, 11/30, 11/76*
U.S. Cl. 252—411 R 8 Claims

A hydrocracking catalyst containing an Iron Group metal on a silica-aluming refractory oxide support is deactivated by contact with water vapor at elevated temperatures. The catalytic activity and stability are improved by treating the catalyst in the presence of sulfide with a gas comprising hydrogen and a fluorine compound at a temperature of about 250° to 550° C.

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3,673,109

## PROCESS FOR THE REACTIVATION OF PLATINUM-ON-ALUMINA CATALYSTS

Eugenia Georgescu; Ion Ion Ghejan; Victor Bugur; Ion Zirna; Theodora Mazare; Elena-Lygia Popescu; Bujor Olteanu; Nicolae Marculescu; Traian-Mircea Filotti; Marius-Aurel Barbul, and Ion Calin, all of Ploiesti, Romania, assignors to Institutul De Cercetari Pentru Prelucrarea Titeiului, Ploiesti-Boulv., Republicii, Romania, Ploiesti, Romania

Filed April 1, 1970, Ser. No. 24,845
Claims priority, application Romania, April 8, 1969, 59667
Int. Cl. B01j *11/18, 11/02*
U.S. Cl. 252—415 3 Claims

A process for reactivating or regenerating a catalyst of the platinum-on-alumina type, comprising the steps of:

a. maintaining the catalyst in a reducing medium, preferably containing hydrogen gas, at a temperature between 400° C and 600° C, for a period of substantially 2 to 8 hours in a velocity of gas flow of $1\times10^{-2}$ to $1\times10^{-1}$ $m^3$ of gas per hour and per kg of catalyst;

b. halogenating the catalyst thereafter in a reducing gas medium at a temperature between 400° C and 550° C with a gas-flow rate of $1\times10^{-2}$ to $4\times10^{-1}$ $m^3$ of gas per hour per kg of catalyst using a halogenated organic compound with one to six carbon atoms per molecule and an atomic ratio of halogen:hydrogen no greater than unity and a partial pressure of this compound between 1 and 100 mm Hg for a period of one-half to 10 hours and in the presence of a moisture content of 10 to 50 ppm to bring the halogen content of the catalyst to 0.1 to 1 percent by weight; and

c. oxidizing the catalyst treated in step (b) with oxygen-containing gas of an oxygen concentration increased from 0.2 to atmosphere concentrations over a period of 5 to 15 hours at a temperature of 400° to 600° C and with a gas-flow velocity of 0.5 to 5 $m^3$ per hour per kg of catalyst.

3,673,110

## SURFACE-MODIFIED CELLULOSE

James B. Edwards, Cincinnati, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Filed Dec. 28, 1970, Ser. No. 102,199
Int. Cl. C11d *17/00*
U.S. Cl. 252—427 12 Claims

An adsorbent mass useful in adsorbing dirt and anionic dye molecules in laundering operations and the like is prepared by modifying a cellulosic substrate to render same anionic and thereafter coating the modified surface with certain nitrogen compounds.

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3,673,111

## METHOD FOR THE MANUFACTURE OF SOLID PHOSPHORIC ACID CATALYST

Edward Hovarth, Woodland Hills, Calif., and Gary Youngman, Des Plaines, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed July 13, 1970, Ser. No. 54,612
Int. Cl. B01j *11/82*
U.S. Cl. 252—435 6 Claims

A process for the manufacture of a solid phosphoric acid catalyst. A siliceous adsorbent is admixed with a polyphosphoric acid. The mixture is heated at an elevated temperature and thereafter extruded. High activity - high strength extrudate particles are produced by drying the extrudate first in a steam atmosphere and then in a dry air atmosphere.

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3,673,112

## HYDROCONVERSION CATALYST PREPARATION

Gerald S. Levinson, San Francisco, Calif., assignor to Shell Oil Company, New York, N.Y.

Continuation-in-part of Ser. No. 689,342, Dec. 11, 1967, abandoned. This application May 13, 1970, Ser. No. 36,721
Int. Cl. B01j *11/78*
U.S. Cl. 252—441 11 Claims

Incorporation of 30–65 percent of a hydrogenation metal component into a hydrogel which would yield on drying and calcining without the hydrogenation metals a xerogel of a high compacted bulk density (0.8–1.6 g/cc) low pore volume (0.15–0.45 cc/g.) alumina results in a catalyst having a very high hydrogenation and dentrification activity. Up to about 10 percent fluoride is added to provide a cracking component. The hydrogenation metal component is selected from the oxides of nickel, molybdenum, tungsten, cobalt and mixtures thereof.

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3,673,113

## PROCESS FOR PREPARING FLUORINATION CATALYST

Daiji Naito, Osaka, and Shigeyoshi Ogawa, Takatsuki, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka-shi, Osaka-fu, Japan

Filed Dec. 30, 1970, Ser. No. 102,926
Claims priority, application Japan, Dec. 30, 1969, 45/1581
Int. Cl. B01j *11/78*
U.S. Cl. 252—441 3 Claims

A process for preparing a fluorination catalyst chromium oxyfluoride which comprises subjecting chromium fluoride to heat treatment at a temperature from 300° to 420° C. in the presence of oxygen and then subjecting the resulting product to heat treatment at a temperature from 500° to 700° C. in the absence of an active gas.

3,673,114

## DISPROPORTIONATION CATALYSTS

Keith George Allum, Bracknell, and Peter John Robinson, Isleworth, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Jan. 28, 1970, Ser. No. 6,560

Claims priority, application Great Britain, Feb. 7, 1969, 6,681/69

Int. Cl. B01j 11/40

U.S. Cl. 252—454 3 Claims

A catalyst for the disproportionation of olefins is prepared by (i) adsorbing aluminum ions into silica (ii) adsorbing sodium ions and (iii) adsorbing ions of one or more of the metals rhenium, tungsten and molybdenum. The catalyst is activated by heating to 350° to 650° C. for up to 16 hours.

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3,673,115

## CATALYSTS

Bastiaan Gerardus Linsen, Maasland, and Theo Jan Osinga, Vlaardingen, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Dec. 30, 1969, Ser. No. 889,290

Claims priority, application Luxembourg, Dec. 30, 1968, 57.716

Int. Cl. B01j 11/22

U.S. Cl. 252—459 10 Claims

In a process for the preparation of a nickel-on-silica catalyst, the use of an intimate mixture of an organic base, which base is substantially insoluble in the suspension of silica in aqueous nickel salt solution, as a means of withdrawing hydrogen ions from the solution and causing precipitation of nickel from the solution on to the silica carrier.

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3,673,116

## RANEY MIXED CATALYST

Gerhard Richter, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed May 11, 1970, Ser. No. 36,402

Claims priority, application Germany, June 7, 1969, P 19 28 929.3

Int. Cl. B01j 11/22

U.S. Cl. 252—466 T 21 Claims

A Raney mixed catalyst for use as a fuel cell electrode. The catalyst contains nickel, iron and one of the metals titanium or zirconium. The catalyst is prepared from a Raney alloy, which contains aluminum as the inactive component. The alloy is in at least one or two homogeneous quaternary phases.

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3,673,117

## ELECTRICAL RESISTANT MATERIAL

Duane Arthur Schroeder, East Dundee; Alvin Dennis Weiss, Chicago, and Benedict Clare Giltner, Bensenville, all of Ill., assignors to Methode Development Company, Chicago, Ill.

Filed Dec. 19, 1969, Ser. No. 886,645

Int. Cl. B44d 1/18; H01b 1/06

U.S. Cl. 252—512 8 Claims

Electrical resistance elements are formed using minute amounts of noble metal oxide hydrate in a vitreous binder with or without the inclusion of high electrical resistance metals or their oxides to adjust the ohmic value of the elements.

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3,673,118

## COMPOSITE ARTICLE CONTAINING HIGH PURITY HOT PRESSED BORON NITRIDE

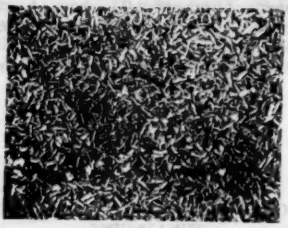
Victor Mandorf, Jr., Olmsted Falls, and Lionel Clayton Montgomery, North Olmsted, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 822,214, May 6, 1969, abandoned. This application July 1, 1970, Ser. No. 51,525

Int. Cl. H01b 1/06

U.S. Cl. 252—520 12 Claims

High purity boron nitride articles of manufacture having a high density and improved properties. The improved boron nitride articles have a unique acicular crystal structure, an oxygen content of less than 0.5 per cent by weight, a density of at least 1.9 grams/cc., excellent hot strength, low coefficients of thermal expansion with no irreversible thermal expansion, excellent thermal shock resistance, moisture insensitivity and improved dielectric properties. These articles are produced by treating conventional hot pressed boron nitride articles with a suitable solvent to lower their boron oxide ($B_2O_3$) content,



and then sintering the treated material in an inert atmosphere at a temperature of from 1,600° to 2,100° C. in the absence of pressure or mechanical restraint. If it is desired to render these articles electrically conductive, an electrically conductive refractory compound may be incorporated therein. Composite articles produced in this manner can be used to produce resistance heated evaporating crucibles for the vaporization of metals.

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3,673,119

## SEMICONDUCTING CERAMIC COMPOSITIONS

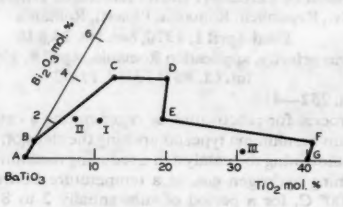
Hisayoshi Ueoka, Ichikawa-shi; Kazuo Horii, Hunabashi-shi, and Kazumasa Umeya, Ichikawa-shi, all of Japan, assignors to TDK Electronics Co. Ltd., Tokyo, Japan

Filed Oct. 9, 1969, Ser. No. 865,031

Claims priority, application Japan, Oct. 11, 1968, 43/73664; Oct. 12, 1968, 43/74098

Int. Cl. H01b 1/06; C04b 35/00

U.S. Cl. 252—520 1 Claim




Ceramic semiconducting compositions are provided herein in which compositions consist primarily of $BaTiO_3$ and minor amounts of $Bi_2O_3$ and $TiO_2$ in the proportions defined in FIG. 1 of the drawings under the Region described by line A-B-C-D-E-F-G and which compositions further contain 0.01 to 4 mol % of $MnO_2$. The disclosure also provides for a method of producing compositions having the aforementioned proportions by mixing the oxides defined by FIG. 1 with $MnO_2$, pressing the ceramic composition into the desired shape and then sintering the compositions in air, followed by reducing the compositions in a reducing atmosphere at elevated temperatures. Ceramics produced from the compositions described above exhibit a large capacitance among other desirably electrical properties and may be conveniently produced in a small compact form.

3,673,120

## PERFUMERY COMPOSITIONS CONTAINING PATCHOULI OIL AND 8-CAMPHENE CARBINOL

John Francis Janes, Epping, Essex; Brian George Jaggers, Romford, Essex, and Anthony John Curtis, Southsea, all of England, assignors to Bush Boake Allen Limited, London, England

Filed July 8, 1969, Ser. No. 840,029
Claims priority, application Great Britain, July 23, 1968, 35,198/68
Int. Cl. C11b 9/00
U.S. Cl. 252—522 7 Claims

The known compound 8-camphene carbinol has been found to act as a perfumery extender for Patchouli Oil in perfumery compositions when present in a concentration of from 1 to 200 parts by weight per 100 parts by weight of the Patchouli Oil. This extended Patchouli oil may be substituted for natural Patchouli Oil without significant impairment of aroma in many applications.

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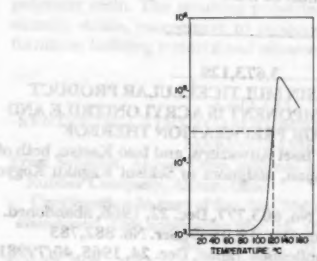
3,673,121

## PROCESS FOR MAKING CONDUCTIVE POLYMERS AND RESULTING COMPOSITIONS

John V. Meyer, Brighton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 27, 1970, Ser. No. 6,086
Int. Cl. H01b 1/06; C08k 1/02
U.S. Cl. 252—511 9 Claims



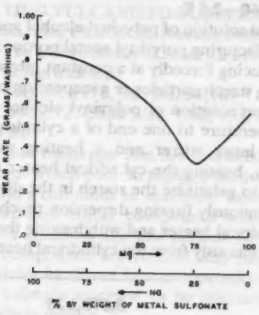

Conductive polymer having a steeply-sloped positive temperature coefficient (PTC) of resistance is composed of crystalline polymer having a narrow molecular weight distribution and filled with conductive particles such as carbon black, tin powder, gold powder, silver powder and other conductive particles which do not oxidize at the temperatures to which the composition is subjected during processing. Additional additives are incorporated to impart desired characteristics. Stabilizing agents which prevent deterioration of the resistance characteristics of the material include alkylated polyhydroxy phenol and phenylbetanapthylamine. (Dialkylphenol-sulfide may be added to reduce degradation at a metal polymer interface thus reducing contact resistance). Flame retardants which do not deleteriously effect the resistance characteristics include phenylbetanapthylamine high chlorinated perchloropentacyclodecane and antimony oxide. The several ingredients are for a preliminary mixed together, then subjected to a more thorough mixing step to effect an adequate dispersion of the filler material throughout the polymer, and then subjected to shearing forces for a limited period of time while maintaining the mix within a desired temperature range. The mix is then formed in the desired configuration as by inserting into a preheated mold while still at an elevated temperature. The formed element is removed from the mold and machined preferably to a rough finish to facilitate bonding of electrically conductive coatings to spaced locations thereof. The element is then coated with electrically conductive coating and annealed to minimize contact resistance.

3,673,122

## HYDROGENATED OLEFIN SULFONATE DETERGENT BARS

Gar Lok Woo, Tiburon, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed March 27, 1969, Ser. No. 811,153
Int. Cl. C11d 1/12, 3/065
U.S. Cl. 252—555 4 Claims




Non-soap hydrogenated olefin sulfonate detergent toilet bars having improved slough loss and wear rate characteristics comprise a mixture of the sodium and magnesium salts of hydrogenated olefin sulfonates containing from 10 to 25 carbon atoms in a ratio of the sodium to the magnesium salt of 2:1 to 1:20 and a plasticizing amount of water.

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3,673,123

## 2,2',4,4'-TETRACHLORO-5,5'-DIAMINO-DIPHENYL ETHER

Peter Tacke; Rudolf Binsack, both of Krefeld, and Oskar Weissel, Krefeld-Bockum, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 27, 1970, Ser. No. 15,251
Claims priority, application Germany, March 21, 1969, P 19 14 367.0
Int. Cl. C07c 93/14
U.S. Cl. 260—571 1 Claim

The 2,2',4,4'-tetrachloro-5,5'-diamino-diphenyl ether which is useful as starting material for the production of polyamides and polyurethanes and which may be obtained by the reduction of the corresponding dinitro compound.

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3,673,124

## SOLUBLE OIL COMPOSITION

Le Roy W. Holm, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 713,303, March 15, 1968, Pat. No. 3,482,632. This application Aug. 27, 1969, Ser. No. 853,522
Int. Cl. C09k 3/00
U.S. Cl. 252—8.55 D 10 Claims

A soluble oil composition comprising a mixture of liquid hydrocarbon, a surface active agent and butyl Cellosolve that is particularly adapted for use as a displacement fluid in a miscible flooding process. The soluble oil composition can be employed as a substantially anhydrous liquid or as a water-in-oil microemulsion.

## 3,673,125
## METHOD OF PRODUCING POLYVINYL ACETAL POROUS ARTICLES

**Kenji Takahashi; Toshio Yamamura; Mitsuzo Ono, and Korekiyo Eda, all of Sowa-machi, Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan**

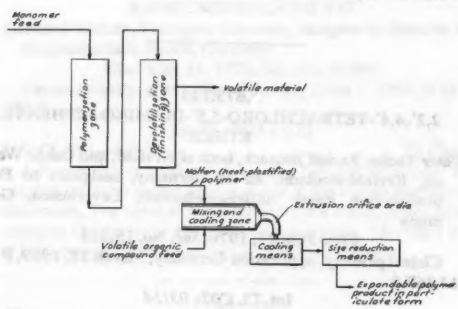
**Filed May 6, 1970, Ser. No. 35,104**
**Claims priority, application Japan, May 10, 1969, 44/35516**
**Int. Cl. C08j *1/14, 1/30***
**U.S. Cl. 260—2.5 F** **5 Claims**

A mixed solution of polyvinyl alcohol and gelatinized starch for manufacturing polyvinyl acetal porous articles is prepared by introducing forcedly at a constant rate a dispersion formed by adding starch particles or a suspension of starch particles to an aqueous solution of polyvinyl alcohol having a relatively low temperature to one end of a cylindrical heater provided with an inner stirrer and a heating means in the outer periphery, heating the cylindrical heater at a sufficient temperature to gelatinize the starch in the dispersion by the time the continuously flowing dispersion reaches the other end of the cylindrical heater and withdrawing the gelatinized dispersion continuously from the cylindrical heater.

## 3,673,126
## CONTINUOUS PROCESS FOR MAKING EXPANDABLE THERMOPLASTIC RESIN COMPOSITIONS

**William D. Carmody; Charles J. Thompson, and George J. Butzler, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Nov. 13, 1967, Ser. No. 682,436**
**Int. Cl. C08j *1/26***
**U.S. Cl. 260—2.5 E** **3 Claims**




A continuous process for the production of expandable thermoplastic polymer compositions obviating the use of a pressure vessel for polymerization is described. Freshly polymerized, devolatilized polymeric melt and a blowing agent are mixed prior to complete cooling of the melt and extruding the mixture at a continuous rate equal to the rate at which the mixture is supplied, to obtain greatly improved product properties.

## 3,673,127
## ULTRAFINE POROUS POLYMER ARTICLE AND METHOD OF MAKING

**Joseph L. Weininger, and Fred F. Holub, both of Schenectady, N.Y., assignors to General Electric Company**

**Filed Oct. 20, 1969, Ser. No. 867,925**
**Int. Cl. C08f *47/08, 29/12***
**U.S. Cl. 260—2.5 HA** **2 Claims**

Ultrafine porous polymer articles with a predetermined maximum pore radius and processes of producing such polymer articles are described wherein a thermoplastic polymer body is contacted with an aqueous solution of a selected monomer, a specified differential pressure is applied between opposite body sides, only the pores with a radius larger than the predetermined radius are wetted by the solution of the monomer, the solvent is evaporated, and the monomer is polymerized in situ. The resulting article is a composite structure consisting substantially of a first thermoplastic polymer, and a small addition of a second polymer in the former pores which were larger than the predetermined maximum pore radius.

## 3,673,128
## CELLULAR POLYOXAZOLIDINONE ELASTOMERS FROM POLYISOCYANATES AND POLYEPOXIDES

**Edward F. Hayash, Jr., Killingworth; Harold E. Reymore, Jr., Wallingford, and Adnan A. R. Sayigh, North Haven, all of Conn., assignors to Upjohn Company, Kalamazoo, Mich.**

**Filed April 8, 1968, Ser. No. 719,678**
**Int. Cl. C08g *22/46, 22/16***
**U.S. Cl. 260—2.5** **8 Claims**

High temperature resistant, low flame spread cellular polymers are disclosed. These polymers are obtained by reacting an organic polyisocyanate and a polyepoxide in approximately stoichiometric proportions in the presence of a tertiary amine catalyst (triethylene diamine preferred) and a blowing agent. Non active-hydrogen containing flame retardants, surfactants, pigments, and like additives can be incorporated into the cellular polymers of the invention. The novel cellular polymers are useful in thermal insulation and like applications where resistance to extreme temperatures and low flame spread requirements must be met.

## 3,673,129
## SYNTHETIC RESIN MULTICELLULAR PRODUCT WHOSE MAIN COMPONENT IS ACRYLONITRILE AND PROCESS FOR PREPARATION THEREOF

**Norio Sagane, Kyoto; Issei Kuwazuru, and Isao Kaetsu, both of Osaka-fu, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha**

**Continuation of Ser. No. 603,777, Dec. 22, 1966, abandoned. This application Dec. 19, 1969, Ser. No. 882,783**
**Claims priority, application Japan, Dec. 24, 1965, 40/79981**
**Int. Cl. C08f *47/10*; C08j *1/20, 1/22***
**U.S. Cl. 260—2.5 R** **8 Claims**

Process for preparing multicellular products which comprises mixing urea and/or a urea derivative, and an acid with a monomeric mixture comprising 60–95 percent by weight of acrylonitrile and 40–5 percent by weight of a vinyl monomer copolymerizable with acrylonitrile, polymerizing the mixture with the use of catalyst and/or by irradiation, and thereafter heating the resulting polymer at 100°–250° C.; and multicellular products produced by the above process, in which fine cells having an average diameter of less than 1.0 mm are substantially uniformly dispersed in the polymer and which product has a specific gravity of less than 0.3 g/cm$^3$.

## 3,673,130
## NON-PUNKING PHENOLIC FOAM

**Anthony Joseph Papa, St. Albans, and William Robert Proops, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.**

**Filed April 4, 1969, Ser. No. 813,768**
**Int. Cl. C08g *53/10, 51/62***
**U.S. Cl. 260—2.5 F** **5 Claims**

Non-punking phenolic foams are obtained by inclusion of certain phosphorus-containing compounds in the reaction mixture. The phosphorus compounds include tris(2-chloroethyl)-phosphate, bis(hydroxymethyl)phosphinic acid, tetrakis(hydroxymethyl)phosphonium chloride, the hydroxyalkyl polyphosphates obtained from the reaction of an alkylene oxide with a polyphosphoric acid, and the adduct of ammonia with phosphorus pentoxide.

3,673,131

## PROCESS FOR PREPARING NON-POROUS POLYMERS FROM VINYL MONOMERS

Louis C. Rubens, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 610,464, Jan. 20, 1967, abandoned. This application Dec. 1, 1969, Ser. No. 881,283

Int. Cl. C08f *47/10, 1/04, 3/30*

U.S. Cl. 260—2.5 R 2 Claims

This invention relates to a process for preparing glassy, non-porous polymers from vinyl monomers by polymerizing the monomer in the essential absence of water, solvents or gases at a temperature less than about 60° C and under a continuously applied compressive force of at least about 300 psi, and wherein the polymerization reaction is conducted in a reactor which is initially essentially completely filled with the monomer to be polymerized.

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3,673,132

## FOAMS FORMED BY HARDENING EMULSIONS OF GLYCOL IN POLYESTER RESIN

Earl E. Parker, Allison Park, and Charles B. Friedlander, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 2, 1969, Ser. No. 881,592

Int. Cl. C08j *1/14*

U.S. Cl. 260—2.5 N 8 Claims

Polyester foams are formed by emulsifying a mixture of glycol in polyester and vinyl monomer and hardening the polyester resin. The resulting polyester resin foam is dimensionally stable, inexpensive to produce, and may be used as furniture, building material and ornamental objects.

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3,673,133

## SYNTHETIC LATEX FOAM RUBBER AND METHOD OF MAKING SAME

Ernst Schmidt, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 744,677, June 26, 1958, abandoned. This application Dec. 18, 1961, Ser. No. 160,343

Int. Cl. C08j *1/16*

U.S. Cl. 260—2.5 L 36 Claims

This invention relates to an internally reinforced synthetic butadiene rubber latex containing a rubber reinforcing substance.

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3,673,134

## AGRICULTURAL MULCH

Bernard F. Anderson, West Chester, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 3, 1970, Ser. No. 60,724

Int. Cl. C08c *9/06;* A01g *13/02*

U.S. Cl. 260—5 6 Claims

A film plastic in nature for use as an agricultural mulch. The film is a blend of an ethylene polymer, a substantially amorphous ethylene/propylene copolymer, a natural rubber and a paraffin wax. The films are sufficiently tough and flexible to allow handling and laying out on a planted soil surface, yet they readily rupture under the pressure of a growing seedling to allow plant penetration. The films degrade during a growing season to the point that they can be readily disposed of by plowing and/or disking into the ground.

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3,673,135

## PRINTING INK

Carl B. Blake, Bronx, and George K. L. Tung, Richmond, both of N.Y., assignors to Frye Industries Inc., New York, N.Y.

Division of Ser. No. 583,688, Oct. 3, 1966, Pat. No. 3,510,340. This application Oct. 6, 1969, Ser. No. 871,118

Int. Cl. C08b *21/08;* C08f *39/48;* C09d *11/14*

U.S. Cl. 260—17 A 3 Claims

A printing ink instantaneously hardenable upon contact with a catalyst comprising 65 to 80 weight percent of a varnish having a major amount of a liquid monomer of acrylic or methacrylic di- or triester and a minor proportion of a resin compatible with the liquid monomer, 10 to 30 weight percent pigment, a tertiary aromatic amine accelerator and 1 to 10 weight percent wax.

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3,673,136

## POWDERED POLYSACCHARIDE-REINFORCED ELASTOMER MASTERBATCHES, COMPOUNDS, AND RESULTING VULCANIZED RUBBERS

Russell A. Buchanan, and Charles R. Russell, both of Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture

Filed July 24, 1970, Ser. No. 58,187

Int. Cl. C08c *9/12;* C08d *9/06;* C08f *45/14*

U.S. Cl. 260—17.4 BB 9 Claims

Powdered elastomer masterbatches are prepared by grinding dried rubber curds which contain highly effective reinforcing agents. Such finely comminuted elastomer masterbatches provide stable powdered rubber compounds when blended with usual powdered curatives and fine particle fillers. These powdered rubber compounds are formed into finished vulcanized rubber articles by direct heat-compression molding, by extrusion from a simple machine, or by injection molding without prior high shear mixing.

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3,673,137

## COATING COMPOSITIONS

Auguste Louis Luciene Palluel, Windsor, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 624,128, March 20, 1967, abandoned. This application Dec. 9, 1969, Ser. No. 875,066

Claims priority, application Great Britain, March 25, 1966, 13,323/66

Int. Cl. C08g *5/20*

U.S. Cl. 260—19 13 Claims

A coating composition capable of being crosslinked on a substrate to which it is applied which contains an acidic film-forming material containing at least two carboxyl groups and a phenolic material containing at least two 47 groups —$CH_2$.NR $_1R_2$ substituted in positions ortho and/or para to one or more phenolic hydroxy groups, $R_1$ and $R_2$ being alkyl or substituted alkyl groups.

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3,673,138

## MECHANICAL OXIDATION OF UNSATURATED POLYESTERS

Thomas G. Harris, 110 Jackson Drive, Lancaster, Pa.

Filed Sept. 14, 1970, Ser. No. 72,152

Int. Cl. C08f *27/10, 27/22;* C08g *17/14*

U.S. Cl. 260—22 TN 1 Claim

Liquid unsaturated polyester resins may be converted to millable compositions by blending the liquid polyester with a metallic drier and oxidizing the liquid mixture at elevated temperatures by mechanically mixing in the presence of an oxidizing atmosphere. A viscous gel forms on oxidation which, on cooling to room temperature, is suitable for compounding, milling and curing to form useful materials such as rubbery compositions, caulking compounds and resilient flooring.

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3,673,139

## PROCESS FOR THE PRODUCTION OF INJECTION MOULDED AND EXTRUSION MOULDED POLYESTER PRODUCTS

Joseph Hrach, Kufstein/Tirol, Austria, assignor to Sandoz Ltd., Basle, Switzerland

Filed April 6, 1970, Ser. No. 26,114

Int. Cl. C08g *17/003, 17/14*

U.S. Cl. 260—22 R 17 Claims

Process for the production of injection moulded and extrusion moulded polyesters from diols and dicarboxylic acids of which at least 85 mol. percent consists of terephthalic acid,

which process consists of condensing in the polyester 0.001 to 1 mol. percent of at least one compound bearing not less than three polyester-forming functional groups, such as OH and/or COOH groups, and incorporating in the polyester, either before or during processing, 0.001 to 2 percent by weight, in relation to the total amount of monomer units, of at least one substance which promotes crystallization.

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3,673,140

## ACTINIC RADIATION CURING COMPOSITIONS AND METHOD OF COATING AND PRINTING USING SAME

Joseph Francis Ackerman, Cedar Grove; Joseph Weisfeld, Fair Lawn; Robert George Savageau, Pompton Lakes, and George Beerli, North Arlington, all of N.J., assignors to Inmot Corporation, New York, N.Y.

Filed Jan. 6, 1971, Ser. No. 104,343
Int. Cl. C09d 3/66, 11/10
U.S. Cl. 260—22 TN 25 Claims

Printing ink compositions preferably comprising epoxidized soybean oil acrylate or certain derivatives thereof and a radiation sensitizer having a triplet energy between about 42 and 85 kcal/mole. Also, the method of printing with such inks comprising exposing the inks to an amount of actinic radiation effective to polymerize the inks to a non-offsetting state and the printed substrate produced by this method.

Novel alkyd-derived compositions used as vehicles for the above printing ink compositions and preferably comprising the reaction product of

1. an alkyd formed from trimethylol propane, tall oil fatty acid, and adipic acid with
2. the reaction product of toluene diisocyanate and the monoacrylic acid ester of ethylene glycol.

The method of coating with such compositions comprising exposing them, in combination with a radiation sensitizer, to an amount of radiation effective to polymerize them to a non-offsetting state.

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3,673,141

## MOLDING MATERIAL BASED ON BITUMEN

Hans-Georg Trieschmann, Hambach; Leo Unterstenhoefer, Limburgerhof, and Heinz Berbner, Weiher, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Oct. 29, 1969, Ser. No. 872,367
Claims priority, application Germany, Nov. 5, 1968, P 18 07 071.8; June 27, 1969, P 19 32 588.3
Int. Cl. C08f 45/52
U.S. Cl. 260—28.5 AS 5 Claims

Molding material comprising (a) a specially selected bitumen left as a residue in the distillation of petroleum which has been deacidified with calcium hydroxide and (b) an olefin polymer. The molding material may be pigment-colored and is used in the form of sheeting for insulation in construction.

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3,673,142

## PREPARATION OF STABLE LATEXES FROM ETHYLENICALLY UNSATURATED POLYMERIZABLE SURFACTANT AND SOLUTION OF PREFORMED WATER INSOLUBLE POLYMER OF AN ETHYLENICALLY UNSATURATED COMPOUND

Frank L. Saunders, and David P. Sheetz, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 16, 1970, Ser. No. 11,867
Int. Cl. C08f 45/24
U.S. Cl. 260—29.6 RW 14 Claims

Stable latexes are prepared by mixing a polymerizable surfactant, water and a substantially water-insoluble polymer dissolved in a non-aqueous solvent to form an initial dispersion of the solution in water, subjecting the dispersion to emulsion polymerization conditions, evaporating the solvent and optionally concentrating the remaining aqueous dispersion.

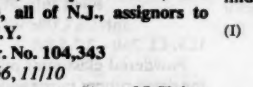
3,673,143

## OPTICALLY ANISOTROPIC SPINNING DOPES OF POLYCARBONAMIDES

Thomas I. Bair, and Paul W. Morgan, both of West Chester, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 39,566, May 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 693,739, Dec. 27, 1967, abandoned. This application June 24, 1970, Ser. No. 49,539
Int. Cl. C08g 51/50, 51/44
U.S. Cl. 260—30.2 5 Claims

Fibers of high molecular weight p-oriented polycarbonamides of recurring units of the formula:

(I) 

wherein $Ar_1$ is p-phenylene and/or chloro-substituted p-phenylene, and $Ar_2$ is p-phenylene. These fibers have an initial modulus in excess of 170 gpd. and an orientation angle of up to 40° and/or a sonic velocity of at least about 4 km./sec. either as-extruded or after maintaining the fibers at 0.99 to 1.50 times their as-spun lengths and heating in a zone maintained between 200° and 1,000° C.

Optically anisotropic spinning dopes of these polycarbonamides of Formula I units, lithium or calcium chloride and certain amide or urea solvents, are also disclosed.

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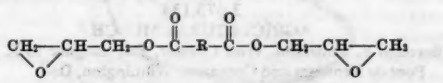
3,673,144

## THERMOPLASTIC MOLDING COMPOSITIONS CONTAINING POLYESTERS

Klaus Weissermel, Kelkheim/Taunus; Rudolf Uebe, Hofheim/Taunus, and Horst Pfister, Frankfurt/Main, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Filed July 2, 1969, Ser. No. 838,686
Claims priority, application Germany, July 4, 1968, P 17 69 729.9
Int. Cl. C08g 51/36
U.S. Cl. 260—30.4 R 17 Claims

The present invention relates to polyester molding compositions from linear saturated polyesters, inert inorganic solid materials and 2,3-epoxy propanol esters of polyfunctional carboxylic acids of the formula



which molding compositions may be worked up in the thermoplastic range and from which molded articles can be made which are free from flash-formation.

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3,673,145

## POLYIMIDE SOLUTION AND METHOD OF PREPARING SAME

Muneyoshi Minami; Masaharu Taniguchi, both of Otsu-shi; Tadao Tsutsomi, Shiga-ken; Masakazo Murakami, Otsu-shi, and Toshiya Yoshii, Otsu-ken, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Sept. 2, 1969, Ser. No. 862,601
Claims priority, application Japan, Sept. 2, 1968, 43/62317; Jan. 22, 1969, 44/4147
Int. Cl. C08g 51/28, 51/44
U.S. Cl. 260—32.4 N 7 Claims

Novel polyimide solutions are provided which are obtained by reacting 1,2,3,4-butane tetracarboxylic acid or a functional derivative thereof with an organic diamine for example an aromatic diamine such as diaminodiphenyl ether in certain reaction solvents for example phenols, nitrobenzenes, pyridines, quinolines, N-alkyl lactams and cyanobenzenes at a tempera-

ture of from 100° C. to the boiling point of the reaction mixture until a polyimide solution is obtained having an imidization ratio of 50–98 percent is obtained. The products thus obtained can be employed as varnishes, to make film coating for electric cable, as adhesives or blended with pigments and the like to make pains.

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3,673,146

## METHOD FOR STABILIZING PIGMENTED POLYCARBONATE RESINS

Arnold Factor, Scotia, N.Y., assignor to General Electric Company

Filed Feb. 24, 1971, Ser. No. 118,577
Int. Cl. C08g 51/04
U.S. Cl. 260—37 PC 4 Claims

A method is provided for stabilizing polycarbonate resin tinted with ultramarine pigment, involving the incorporation of the ultramarine pigment into the polycarbonate resin as an arylsiloxane-pigment blend. There also is employed with the arylsiloxane-pigment blend, polycarbonate resin stabilizers such as triorganophosphite, and a cyclo aliphatic epoxy compound. The stabilized resin can be remolded without a significant increase in the Yellow Index of the resin.

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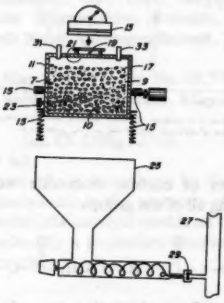
3,673,147

## METHOD OF PREPARING DELUSTERED FILAMENTS AND FIBERS

Thomas P. Bor, Richmond, Va., assignor to Allied Chemical Corporation, New York, N.Y.

Filed April 27, 1970, Ser. No. 31,917
Int. Cl. C08g 51/04
U.S. Cl. 260—37 N 9 Claims



The process for preparing delustered filaments and fibers is carried out by adding an amount of delustrant in a ratio of 5 to 20 parts by weight of delustrant per 100 parts of polymer chips under an inert blanket, grinding said delustrant with said polymer chips with grinding balls of about one-half to 1¼ inches in diameter by vibrating at about 2 to 10 mm amplitude and at a frequency of about 600 to 3,600 cycles per minute while incrementally increasing the temperature from about ambient to about 20° C. below the softening point of said polymer and obtaining a pigment dispersion of substantially less than 1 micron particle size and separating the balls from the pigmented polymer.

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3,673,148

## ABRASION RESISTANT COATING COMPOSITION OF AN ACRYLIC POLYMER, A POLYESTER AND A THERMOSETTING CONSTITUENT

Joseph A. Vasta, Woodbury, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 20, 1971, Ser. No. 145,535
Int. Cl. C08g 51/04
U.S. Cl. 260—39 R 11 Claims

A coating composition that forms a high quality abrasion resistant finish for fiberglass reinforced plastic sinks and bathtubs contains as the binder

I. an acrylic graft copolymer having attached to its backbone side chain ester units containing reactive hydroxyl groups;

II. a polyester of two or more dicarboxylic acids or anhydrides, a glycidyl ester, a glycol and a triol;

III. an alkylolated medium formaldehyde resin; and contains pigments in a pigment to binder ratio of 50:100 to 250:100 of a blend of a primer pigment such as titanium dioxide and an abrasive pigment of zirconium silicate.

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3,673,149

## FLAME RETARDANT COMPOSITIONS OF MATTER

Alexander Gaydasch, Chicago, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 767,546, Sept. 5, 1968, Pat. No. 3,574,231. This application Dec. 7, 1970, Ser. No. 95,946
Int. Cl. C08f 45/60; C08g 51/60
U.S. Cl. 260—45.8 N 8 Claims

Novel compositions of matter comprising a polymeric compound and an N-substituted polyhalopolyhydropolycyclicdicarboximide as exemplified by polypropylene and quanyl-5,6,7,8,9,9-hexachloro-1,2,3,4,4a,5,8,8a-octahydro-5,8-methano-2,3-naphthalenedicarboximide possess certain physical properties such as being flameproof or fire resistant.

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3,673,150

## GLASS FIBER REINFORCED ELASTOMERS

Alfred Marzocchi, Cumberland, R.I., assignor to Owens-Corning Fiberglas Corporation

Filed Nov. 20, 1969, Ser. No. 878,501
Int. Cl. C08c 13/20
U.S. Cl. 260—41.5 A 6 Claims

The improvement in the bonding relationship between glass fibers and elastomeric materials in the manufacture of glass fiber-reinforced elastomeric products wherein the individual glass fibers are sized, or a bundle of glass fibers are impregnated, with a composition containing a polysulfide.

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3,673,151

## ALKYLHYCLROXYPHENYL THIOALKANONATE STABILIZERS FOR ORGANIC MATERIALS

David Herbert Steinberg, Bronx, N.Y., assignor to Ciba-Geigy Corporation

Division of Ser. No. 772,368, Oct. 31, 1968, Pat. No. 3,598,854. This application Sept. 21, 1970, Ser. No. 74,202
Int. Cl. C08f 45/58; C08g 51/58
U.S. Cl. 260—45.85 3 Claims

Alkylhydroxyphenylthioloacyl alkanoic acid esters of mono- and polymercaptoalkanoic acid esters prepared by known thiolo esterification procedures, are stabilizers of organic material subject to oxidative deterioration.

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3,673,152

## ENHANCEMENT OF RESISTANCE OF OLEFIN POLYMERS TO COPPER-CATALYZED OXIDATIVE DEGRADATION

Motonobu Minagawa, Koshigaya; Kenichi Nakagawa, and Minoru Goto, both of Tokyo, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed May 23, 1969, Ser. No. 827,166
Claims priority, application Japan, May 27, 1968, 43/35426
Int. Cl. C08f 45/60
U.S. Cl. 260—45.8 N 15 Claims

Heterocyclic amines or amides are provided which are useful in the enhancement of the resistance of olefin polymers to copper-catalyzed oxidative deterioration.

Stabilizer compositions are also provided consisting essentially of at least one olefin polymer stabilizer and heterocyclic amines or amides; and olefin polymer compositions, such as propylene polymer compositions, containing heterocyclic

amines or amides; and a process for enhancing the resistance of olefin polymers to copper-catalyzed degradation by incorporation of such compounds or of such stabilizer compositions.

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**3,673,153**

## THERMOSTABLE POLYESTERS AND PROCESS OF PRODUCING SAME

**Erich Behr, Troisdorf, Germany, assignor to Dynamit Nobel AG, Troisdorf Postfach, Germany**

**Filed March 25, 1970, Ser. No. 22,689**

**Claims priority, application Germany, March 26, 1969, P 19 15 374.3**

**Int. Cl. C08g *17/08***

**U.S. Cl. 260—47 C** **4 Claims**

Thermostable polyesters of formula (I) wherein $n$ is 40–200, and the carbonyl and carboxy groups on the pheylene radical are in para or meta positions with respect to each other. The polyesters are useful as electrically insulating materials. They are produced by reaction of diacylchlorides of terephthalic or isophthalic acid with 4,4′-dihydroxytetraphenylmethane.

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**3,673,154**

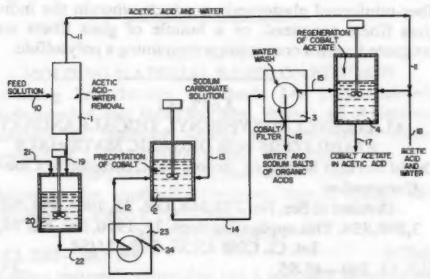
## PROCESS FOR THE RECOVERY OF COBALT CATALYST

**Alvin E. Trevillyan, Naperville, Ill., assignor to Atlantic Richfield Company, New York, N.Y.**

**Filed June 26, 1970, Ser. No. 50,196**

**Int. Cl. C01g *51/00*; C07c *63/02***

**U.S. Cl. 260—524 R** **12 Claims**




There is disclosed a cobalt catalyst recovery process which can provide substantially 100 percent recovery of cobalt from meta- or para-xylene oxidation reaction products, in a catalytically active form relatively free from side reaction, tramp metal and corrosion products. The reaction medium, after recovery of isophthalic or terephthalic acid products, is distilled or flashed, diluted with water to achieve a cobalt concentration and acetic acid concentration sufficient to yield a pH of the solution above 3.0 and to precipitate iron and chromium values. The reaction medium is separated from these precipitates and treated with aqueous sodium carbonate which serves to convert the side reaction organic acids to soluble sodium salts and the cobalt to insoluble cobalt carbonate. Nickel impurities may be converted to a soluble form. The cobalt carbonate is separated out by filtration or the like, and is reconverted to cobalt acetate by treating the carbonate with acetic acid and, if desired, a minor amount of water. The catalyst solution, preferably after water removal, is recycled to the oxidation process.

**3,673,155**

## BIS(ORGANOSILYL)HYDROCARBON MODIFIED POLYAMIDES AND METHODS FOR MAKING THEM

**Fred F. Holub; Abe Berger, and Terry G. Selin, all of Schenectady, N.Y., assignors to General Electric Company**

**Filed Dec. 3, 1969, Ser. No. 881,887**

**Int. Cl. C08g *20/32***

**U.S. Cl. 260—65** **7 Claims**

Bis(aminoorganosilyl)hydrocarbons are employed in combination with organic diacids or organic dianhydrides to provide for the production of bis(organosilyl)hydrocarbon modified polyamides including polyamide acids. The bis(organosilyl)hydrocarbon modified polyamides also can contain chemically combined polydiorganosiloxane. The bis(organosilyl)hydrocarbon modified polyamides can be employed to make molding compounds, and polyamide and polyimide insulating films.

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**3,673,156**

## COPOLYMERS OF CARBON MONOXIDE WITH CARBONYL COMPOUNDS AND PROCESS FOR THEIR PREPARATION

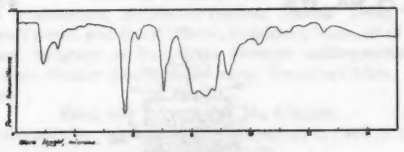
**Guidobaldo Cevidalli; Mario Ragazzini, both of Milano, and Mario Modena, Bollate, Milan, all of Italy, assignors to Edison, Milan, Italy**

**Continuation of Ser. No. 272,073, April 10, 1963, abandoned. This application June 5, 1967, Ser. No. 645,543**

**Claims priority, application Italy, April 11, 1962, 7149/62**

**Int. Cl. C08g *1/02*, *1/04***

**U.S. Cl. 260—67 FP** **10 Claims**

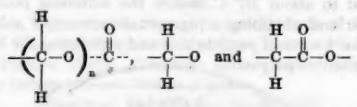


IR. Spectrum of a copolymer of carbon monoxide and formaldehyde having an analysis of 41% C and 4.8% H and an "r" value = 0.9.

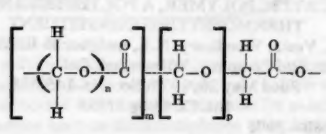
Copolymers of carbon monoxide with carbonylic compounds having all of the groups

$$-CH_2-O-,\ -\overset{O}{\overset{\|}{C}}-CH_2-O-CH_2-\overset{O}{\overset{\|}{C}}-O-,\ -\overset{O}{\overset{\|}{C}}-CH_2-O-$$

and a process for making these copolymers which involves reacting under anhydrous conditions, carbon monoxide and formaldehyde monomer, linear polymers thereof or trioxane in the presence of a catalyst selected from the group of cationic chlorinated and fluorinated derivatives of an element selected from the groups III, IV, V and VIII of the Periodic Table, at a temperature between about −110° C and +250° C under a pressure of about 30 to 5,000 atm. to produce a polymer consisting essentially of all of the structural units:



in a random distribution and as represented by the formula:



wherein $n$, $m$ and $p$ are whole numbers >0 .

3,673,157

## ZINC AND MANGANESE GENTISATE AS POLYESTER CATALYSTS AND MOLECULAR WEIGHT ENHANCER

John A. Price, Swarthmore, and Mary J. Stewart, Media, both of Pa., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 17,925, March 9, 1970, abandoned. This application July 31, 1970, Ser. No. 60,111

Int. Cl. C08g *17/013*

U.S. Cl. 260—75 R 1 Claim

Zinc and manganese gentisate and fiber and film-forming polyester resins comprising the condensation polymerization product of (a) a saturated diester, (b) a saturated diol, and (c) a catalytic amount of zinc or manganese gentisate.

3,673,158

## SULFOBETAINE GLYCOL MODIFIED POLY(ETHYLENE TEREPHTHALATE)

Arthur M. Reader, Corpus Christi, Tex., and Robert W. Stackman, Morris Township, Morris County, N.J., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 838,033, June 23, 1969, abandoned, which is a continuation of Ser. No. 604,138, Dec. 23, 1966, abandoned. This application Aug. 14, 1970, Ser. No. 70,615

Int. Cl. C08g *17/08, 20/20*

U.S. Cl. 260—75 N 4 Claims

Sulfobetaine glycols prepared by reaction of bis (hydroxyalkyl) amines with sultones are incorporated into polyesters and polyamides to improve dyeability.

3,673,159

## MANUFACTURE OF POLYURETHANES USING ORGANIC ZIRCONIUM COMPOUNDS AS CATALYSTS

Willem Dijkhuizen, Zuidlaren, Netherlands; Erich Termin, Niederkassel, Germany; Otto Bleh, Bergheim/Sieg, Germany, and Dieter Morgenstern, Rosrath, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed May 11, 1970, Ser. No. 48,775

Claims priority, application Germany, May 10, 1969, P 19 23 934.0

Int. Cl. C08g *22/40*

U.S. Cl. 260—77.5 AB 7 Claims

In the manufacture of a polyurethane by the reaction of a polyol with a polyisocyanate in the presence of a catalyst and in the absence of water, the catalyst used is an organic zirconium compound, preferably a zirconium alcoholate or phenolate, having the formula

$$(Y)mZr(YR)_{4-2m}$$

wherein:

Zr is a zirconium atom

Y is an oxygen or sulfur atom

R is an organic radical of up to 12 carbon atoms, which can be alike or different

m is 0 or 1.

3,673,160

## PROCESS FOR PRODUCING BRILLIANT SULFONATED POLYAMIDE-IMIDE FIBERS AND SUCH FIBERS SO PRODUCED

Francois Buisson, and Jean Paul Gresteau, both of Lyon, France, assignors to Societe Rhodiaceta, Paris, France

Filed Feb. 2, 1971, Ser. No. 112,083

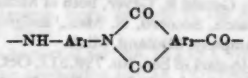
Claims priority, application France, Feb. 12, 1970, 7005024; Nov. 17, 1970, 7041462

Int. Cl. C08g *20/32*

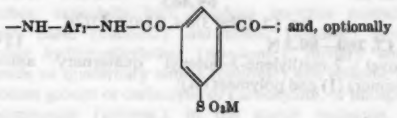
U.S. Cl. 260—78 TF 2 Claims

A process for producing brilliant thermostable polyamide-imide fibers and such fibers so produced, such process comprising extruding an N-methylpyrrolidone solution of a polymer having a structure characterized by the following linkages:

A. amide-imide linkages of the formula:



B. amide linkages of the formula:



C. amide linkage of the formula:

$$—NH—Ar_1—NH—CO—R—CO—$$

wherein $Ar_1$ represents a bivalent aromatic radical, $Ar_2$ represents a trivalent aromatic radical, R represents a bivalent aromatic, aliphatic, cycloaliphatic or arylaliphatic radical, and M represents an alkali or alkaline earth metal, linkages B representing at least 3 percent of the total of linkages A, B and C in an aqueous N-methylpryyolidone coagulating bath; drawing the extruded filaments in air at a rate of at least 1.5 ×; drying the filaments to eliminate N-methylpyrrolidone; and drying the filaments. The filaments obtained are characterized in being brilliant, homogenous, thermostable filaments.

3,673,161

## PREPARATION OF POLYMERS OF LACTAMS WITH REDUCED CRYSTALLINITY

Jan Sebenda, Stresnice Pionyru 1709, and Rudolf Puffr, Senetelska, both of Prague 6, Czechoslovakia

Filed March 17, 1970, Ser. No. 20,430

Int. Cl. C08g *20/18*

U.S. Cl. 260—78 L 4 Claims

Lactam polymers of reduced crystallinity are prepared by incorporating the salts of certain polyvalent cations.

3,673,162

## COPOLYAMIDES FROM BIS(AMINOPHENYL)SULFONE

Alan Buckley, and Ieuan Thomas, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed April 17, 1970, Ser. No. 29,698

Claims priority, application Great Britain, May 2, 1969, 22,509/69

Int. Cl. C08g *20/20*

U.S. Cl. 260—78 R 11 Claims

The hydrolytic stability (and especially the resistance to immersion in boiling water) of polyamides of bis(amino-phenyl)sulphones (or mixtures thereof with up to 20 mole percent of at least one other diamine) and $\alpha,\omega$-polymethylene dicarboxylic acids having from six to 16 carbon atoms in all is improved by replacing from 3 to 36 mole percent of the dicarboxylic acid with a carbocyclic dicarboxylic acid. The products are useful as thermoplastic moulding materials and for conversion of films and fibers.

3,673,163

## PHARMACOLOGICAL PREPARATION CONTAINING AN ACRONYCINE-POLYVINYLPRROLIDONE COPRECIPITATE

W. Douglas Walkling, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed June 16, 1970, Ser. No. 46,810

Int. Cl. C07d *37/12*

U.S. Cl. 260—279 R 5 Claims

A novel pharmaceutical preparation of acronycine comprising an acronycine-polyvinylpyrrolidone coprecipitate of increased solubility.

## 3,673,164
## 2-METHYLENE-3-BUTENYL QUATERNARY AMMONIUM MONOMERS AND POLYMERS

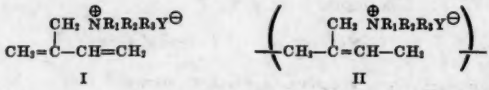
Giffin D. Jones; Gerald R. Geyer, both of Midland, Mich., and Melvin J. Hatch, Socorro, N. Mex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 798,512, Oct. 23, 1968, Pat. No. 3,544,532, which is a division of Ser. No. 381,546, July 9, 1964, abandoned. This application Sept. 3, 1970, Ser. No. 69,443

Int. Cl. C08f 3/84, 15/02, 15/24

U.S. Cl. 260—80.3 N 11 Claims

Novel 2-methylene-3-butenyl quaternary ammonium monomers (I) and polymers (II):



I II

where $R_1$, $R_2$ and $R_3$ are organic groups, are prepared by reaction of 2-halomethyl-1,3-butadiene with a tertiary amine. The quaternary ammonium group increases the water solubility and hydrophilic properties of polymers containing II. Particularly useful are water-soluble quaternary ammonium polymers active as electroconductive additives for paper and other cellulosic products.

## 3,673,165
## PROCESS FOR PREPARING AN ALTERNATING COPOLYMER OF BUTADIENE AND ACRYLONITRILE

Akihiro Kawasaki, Ichihara; Hiroaki Ueda, Chiba, and Masanobu Taniguchi, Ichihara, all of Japan, assignors to Maruzen Petrochemical Co., Ltd., Tokyo, Japan

Filed April 16, 1970, Ser. No. 29,300

Claims priority, application Japan, April 28, 1969, 44/33036; May 31, 1969, 44/42082; May 31, 1969, 44/42083; May 31, 1969, 44/42086

Int. Cl. C08d 1/14, 3/04, 3/06

U.S. Cl. 260—82.5 9 Claims

A process for preparing an alternating copolymer of butadiene and acrylonitrile which comprises contacting butadiene and acrylonitrile in liquid phase with a catalyst, said catalyst comprises the first component selected from the group consisting of an aluminum halide and a zinc halide, a vanadium compound as the second component and the third component selected from the group consisting of an organoaluminum compound, an organozinc compound and an organolithium compound. The alternating copolymers obtained by this invention are rubber-like in character and are useful in the field of rubber, plastics industries, etc.

## 3,673,166
## 1,2-DIALKOXYBENZENES AS RAMDOMIZER FOR COPOLYMERIZATIONS

William J. Trepka, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Dec. 28, 1970, Ser. No. 102,109

Int. Cl. C08d 1/32, 3/02; C08f 19/08

U.S. Cl. 260—83.7 8 Claims

A method for copolymerizing monomeric materials using organolithium compounds as initiators in which 1,2-dialkoxybenzene is introduced into the reaction in a quantity sufficient to produce random copolymers.

## 3,673,167
## POLYVINYL CHLORIDE FIBERS

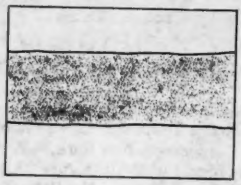
Claude Ledoux, Antony, Hauts de Seine, and Albert De Vries, Chevilly-larve, Val de Marne, both of France, assignors to Produits Chimiques Pechiney Saint Gobain, Neuilly sur Seine, France

Continuation-in-part of Ser. No. 638,177, April 24, 1967, Pat. No. 3,548,049. This application Oct. 30, 1969, Ser. No. 872,560

Claims priority, application France, April 27, 1966, 6659303; March 3, 1967, 6797350; Oct. 9, 1968, 68169192

Int. Cl. D01d 5/08

U.S. Cl. 260—92.8 R 8 Claims



Vinyl chloride homo- and co-polymers are made which have uniform cross section, homogeneous structure, great brilliance, and good transparency. They are far superior in these properties to any polyvinyl chloride homo- or copolymers which were previously known. They may have any desired shape in cross section, for instance those of a square or a star.

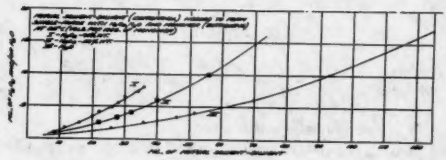
## 3,673,168
## POLYMERIZATION PROCESS

Oliver W. Burke, Jr., 506 Intracoastal Drive, Fort Lauderdale, Fla.; Joseph Austin A. Kizer, 211 S.E. Sixth Court, Pompano Beach, Fla., and Pauls Davis, 30027 White St., Gibralter, Mich.

Continuation-in-part of Ser. No. 447,241, April 12, 1965, abandoned, and a continuation-in-part of Ser. No. 805,080, Jan. 29, 1969, abandoned, which is a continuation of Ser. No. 686,350, Nov. 28, 1967, abandoned, which is a continuation of Ser. No. 447,196, April 12, 1965, abandoned. This application Jan. 22, 1970, Ser. No. 4,812

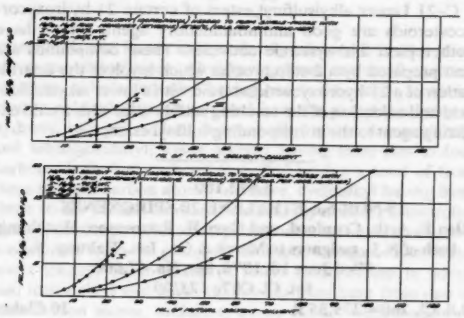
Int. Cl. C08f 1/60, 3/00, 15/00

U.S. Cl. 260—94.2 R 20 Claims



A process for forming polymer material having terminal hydroxyl groups and a number average molecular weight in the range of 500 to 10,000, by (A) forming a single phase polymerization system consisting essentially of hydrogen peroxide, specified vinylidene monomer and/or conjugated diene monomer, and liquid organic mutual solvent diluent comprising at least a major proportion of lower aliphatic satu-

rated oxygenated solvent selected from the alcohols, ether alcohols, keto alcohols and ketones, which system is essentially free of materials that decompose hydrogen peroxide to form



oxygen at below 100° C., and (B) heating said system to temperatures sufficiently above 100° C. to initiate and effect polymerization in said system.

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**3,673,169**

**1,3,4-THIADIAZOLYLAZO-3-(CYCLOHEXYLAMINO)ACYLANILIDE DYES**

**Max A. Weaver; James M. Straley, and William H. Moore, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed June 16, 1969, Ser. No. 833,744**

**Int. Cl. C09b *29/08*; D06p *3/24*, *3/46***

**U.S. Cl. 260—158** **4 Claims**

Monoazo compounds having a 1,3,4-thiadiazolyl diazo component and a 3-(cyclohexylamino)acylanilide coupling component are useful for dyeing nylon and polyester textile materials on which the compounds exhibit improved properties such as excellent dyeability, lightfastness and migration on polyamide fibers and excellent resistance to sublimation on polyester fibers.

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**3,673,170**

**PHENYL-AZO-NAPHTHOL DYES**

**Gerhard Gnad, Ludwigshafen, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Germany**

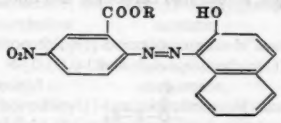
**Filed July 25, 1969, Ser. No. 845,055**

**Claims priority, application Germany, July 26, 1968, P 17 93 039.1**

**Int. Cl. C07c *107/06*; C09b *29/10***

**U.S. Cl. 260—202** **2 Claims**

Monoazo dyes having a 2-amino-5-nitrobenzoic ester as diazo component and β-naphthol as coupling component which are useful for dyeing linear polyesters and polyamides, said dyes being generally represented by the formula:



(I)

where R denotes the linear or branched aliphatic, araliphatic or cycloaliphatic radical of an alcohol.

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**3,673,171**

**STARCHES CONTAINING NON-IONIC, BASIC AND ACIDIC GROUPS AND PREPARATION AND USES THEREOF**

**Lee H. Elizer, Keokuk, Iowa, assignor to The Hubinger Company, Keokuk, Iowa**

**Continuation-in-part of Ser. No. 733,233, May 31, 1968, abandoned. This application July 28, 1970, Ser. No. 58,988**

**Int. Cl. C08b *19/01***

**U.S. Cl. 260—233.3 R** **13 Claims**

Starches, especially high amylose starches containing nonionic, basic (cationic) and acidic (anionic) groups, preferably hydroxyalkylether (non-ionic), tertiary amino, cyanamide or quaternary amino (cationic) and sulfonic acid or sulfonate groups or carboxylic or carboxylate, or phosphate or phosphonate (anionic), in the starch molecule, are prepared which are especially useful for sizing threads or yarns of mixed fibers such as, for example, cotton fibers and polyester fibers, viz., polyethylene terephthalate fibers, and hydrophobic fibers that are difficult to size.

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**3,673,172**

**1,4-DIPHENYL-3,6-[DIMERCAPTO OR EPI (DITHIA OR TETRATHIA)]2,5-PIPERAZINEDIONES**

**Steve George Svokos, Westwood, N.J., and Robert Bruce Angier, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.**

**Continuation-in-part of Ser. No. 833,147, June 13, 1969, Pat. No. 3,560,483. This application April 14, 1970, Ser. No. 28,525**

**Int. Cl. C07d *93/36***

**U.S. Cl. 260—239.3 B** **10 Claims**

This disclosure describes substituted 1,4-diphenyl-3,6-dimercapto-2,5-piperazinediones and substituted 1,4-diphenyl-3,6-epi(dithia or tetrathia)-2,5-piperazinediones useful as antifungal agents.

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**3,673,173**

**PROCESS FOR PREPARATION OF 2α,3α-EPITHIOSTEROID**

**Taichiro Komeno, Osaka, and Hikozo Iwakura, Amagasaki, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan**

**Filed April 30, 1970, Ser. No. 33,522**

**Claims priority, application Japan, May 8, 1969, 44/35340**

**Int. Cl. C07c *167/36***

**U.S. Cl. 260—239.5** **4 Claims**

A process for the preparation of the hormonal 2α,3α-epithio-5α-steroid of estrane, androstane or the pregnane series which comprises reaction of the corresponding $\Delta^2$-5α-steroid with thiocyanogen halide, followed by treatment of the products under basic conditions, some of the products thereof and pharmaceutical compositions containing the products thereof.

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**3,673,174**

**DECONTAMINATION OF REACTION SOLUTIONS CONTAINING DISSOLVED ORGANIC EXPLOSIVES**

**Charles L. Smith, and William S. Reynolds, Jr., both of Kingsport, Tenn., assignors to the United States of America as represented by the Secretary of the Army**

**Filed July 30, 1970, Ser. No. 59,764**

**Int. Cl. C07d *55/16*, *55/60***

**U.S. Cl. 260—239 HM** **7 Claims**

Process for the decontamination of reaction solutions which are contaminated with dissolved organic crystalline explosives, particularly those explosives commonly known as RDX and HMX. The process involves the selective adsorption of the dissolved explosives on activated carbon.

3,673,175

## PREPARATION OF PIPERIDYL-STEROIDS

Geza Schramm, and Horst Riedl, both of Linz, Donau, Austria, assignors to Osterreichische Stickstoffwerke Aktiengesellschaft, Linz, Donau, Austria

Filed April 26, 1971, Ser. No. 137,699

Claims priority, application Austria, April 24, 1970, A 3750/70

Int. Cl. C07c *173/10*

U.S. Cl. 260—239.5 7 Claims

The preparation of piperidyl-steroids having an oxygen-containing group in the 16-position which comprises reacting $C_{16}$-bromo-cyanamides, in a predominantly aprotic and polar medium with an alkali metal salt of a lower aliphatic carboxylic acid or of benzoic acid, isolating the resulting 16-acyloxy-cyanamide and then reducing this compound to remove the nitrile group.

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3,673,176

## SUBSTITUTED -7,12, DIHYDROPLEIALINE DERIVATIVES

Carl Kaiser, Haddon Heights, N.J., and Charles L. Zirkle, Berwyn, Pa., assignors to Smith Kline and French Laboratories, Philadelphia, Pa.

Division of Ser. No. 709,863, March 4, 1968, Pat. No. 3,557,098. This application Aug. 12, 1970, Ser. No. 63,268

Int. Cl. C07d *29/10*

U.S. Cl. 260—240 TC 8 Claims

7,12-Dihydropleiadenes in which the nucleus may have chloro, methyl, methoxy, methylthio or trifluoromethyl substituents and the 7-position is substituted by an aminopropylidene, aminopropyl, piperidylidene, piperidyl, pyrrolidylidene, pyrrolidyl, 2-piperidinylethylidene, 2-piperidinylethyl, 2-pyrrolidinylethylidene or 2-pyrrolidinylethyl moiety are useful as tranquilizers and antidepressants. The compounds are generally prepared by reaction of the appropriate amino Grignard reagent with a 7(12H)-pleiadenone followed by acid dehydration of the 7-hydroxy intermediate and subsequent reduction of the unsaturated derivative with phosphorus and hydroiodic acid. The 1,4-addition products also obtained via the Grignard reaction, namely 6-substituted-7(12H)-pleiadenones, are also useful as tranquilizers and antidepressants.

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3,673,177

## SUBSTITUTED 4-(ANILINOMETHYLENE)-3-GALANTHAMANINONES

Elizabeth Benz Morlock, Bronx, and Leon Goldman, Nanuet, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 4, 1970, Ser. No. 34,591

Int. Cl. C07d *99/04*

U.S. Cl. 260—240.3 8 Claims

This disclosure described compounds of the class of substituted 4-(anilinomethylene)-3-galanthamaninones useful as antibacterial agents and central nervous system depressants.

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3,673,178

## PROCESS FOR PREPARING 2-[2-(ARYLAMINO)-VINYL]-1-(LOWER ALKYL)-3-H-INDOLIUM SALT DYES

Floyd L. Tewksbury, Jr., Eggertsville, and Walter R. Demler, Hamburg, both of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Nov. 14, 1969, Ser. No. 877,033

Int. Cl. C07d *27/38*

U.S. Cl. 260—240.8 16 Claims

Production of water-soluble cationic dyes by reaction of 1-lower alkyl-$\Delta^{2}$- -indolineacetaldehydes, primary and secondary aromatic amines and orthophosphoric acid in an inert water-miscible organic solvent. This improved process provides a substantially quantitative product yield while avoiding addition of dye-precipitating agent to the reaction mass.

3,673,179

## C-21 LOWER ALKYLSULFINYL ESTERS OF CERTAIN 21-HYDROXYCORTICOSTEROIDS

Richard M. Scribner, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed April 22, 1970, Ser. No. 31,003

Int. Cl. C07c *169/32*

U.S. Cl. 260—239.55 9 Claims

C-21 Lower alkylsulfinyl esters of certain 21-hydroxycorticosteroids are good antiinflammatory agents which have both topical and systemic activities. These compounds are best prepared by a 2-step process which involves the esterification of a 21-hydroxycorticosteroid with a lower alkylsulfide-acid and oxidation of the resulting sulfide ester with a mild oxidizing agent to the corresponding sulfinyl ester.

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3,673,180

## 19-NOR-6,6-ETHYLENE-20-SPIROXENES

Glen E. Arth, Cranford, and Gary H. Rasmusson, Watchung, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed June 18, 1970, Ser. No. 47,606

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 R 10 Claims

Novel 19-nor-6,6-ethylene-3-oxo-20-spirox-4-enes (or 4,14-dienes) are provided, prepared from the corresponding 19-nor-3-oxo-spirox-4-enes (or 4,14-dienes). The compounds are useful as orally-effective antiestrogens, and are also anabolic agents having low androgenicity.

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3,673,181

## OXIME CARBAMATE PHOSPHATE, PHOSPHONATE, PHOSPHINATE AND PHOSPHOROAMIDATES AND COMPOSITIONS AND THEIR UTILITY

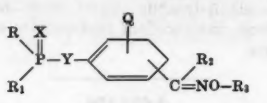
Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Division of Ser. No. 730,588, May 20, 1968, abandoned, which is a continuation-in-part of Ser. No. 646,467, June 16, 1967, abandoned. This application June 25, 1970, Ser. No. 49,938

Int. Cl. C07c *93/00*

U.S. Cl. 260—240 G 6 Claims

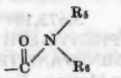
Oxime carbamate phosphates, phosphonates, phosphinates and phosphoroamidates having the general formula:



in which X and Y are independently selected from the group consisting of oxygen and sulfur; R is selected from the group lower alkyl or lower alkoxy, having from one to six carbon atoms inclusive; $R_1$ is selected from the group consisting of lower alkyl or lower alkoxy having from one to six carbon atoms, inclusive, amino, lower alkyl-substituted amino and phenyl; Q is selected from the group consisting of divalent tetramethylenediene-1,3, lower alkoxy or lower alkyl having from one to four carbon atoms inclusive, each, nitro, halogen and combinations thereof, and lower dialkyl-substituted thionophosphoryloxy; $R_2$ is selected from the group consisting of hydrogen, lower alkyl having from one to four carbon atoms, and phenyl; and $R_3$ is selected from the group consisting of hydrogen; substituted carbonate and thiocarbonates of the type

in which Z is oxygen or sulfur, $R_4$ is lower alkyl having from

one to four carbon atoms, inclusive, and β-chloro-loweralkyl having from two to four carbon atoms; carbamates of the type



in which $R_5$ and $R_6$ are independently selected from the group consisting of hydrogen, alkyl having from one to 10 carbons, inclusive, substituted alkyl having one to six carbon atoms inclusive, said substituents selected from the group consisting of hydroxy, halogen, amino, di-lower-alkyl amino, lower alkoxy, and tetrahydrofuryl; lower alkenyl having from two to four carbons, inclusive, carboalkoxy alkyl having a total of from three to eight carbon atoms, inclusive, cycloalkyl having from three to six carbon atoms, inclusive, piperazino, 2-thiazolyl, phenyl, naphthyl, substituted phenyl wherein said substituents are selected from the group consisting of halogen, lower alkyl, lower alkoxy, lower thioalkyl, lower dialkylamino in which said lower alkyl and lower alkoxy moieties have from one to four carbon atoms, inclusive, nitro, cyano, trifluoromethyl, and combinations thereof; and in which

is an N-containing heterocyclic member selected from the group consisting of morpholino, piperazino, pyrrolidino, piperidino, hexamethylenamino, pyrryl, indolyl, imidazolyl, benzimidazolyl, pyrazolyl, 1,3-oxazolidino, and 1,3-thiazolidino; esters of the type

wherein $R_7$ is selected from the group consisting of alkyl having from one to eight carbons inclusive, trichloromethyl, and lower alkenyl having from 2 to 4 carbon atoms, inclusive, and the radical $-(CH_2)_m-SR$ in which $m$ is 1 or 2, R is alkyl having one to six carbon atoms, alkenyl having two to four carbon atoms, phenyl, substituted phenyl in which said substituents are selected from the group halogen, lower alkyl having one to four carbon atoms, inclusive, and lower alkoxy having one to four carbon atoms, inclusive; lower alkyl sulfonato having from one to six carbon atoms, inclusive; lower alkyl substituted thiophosphoryl wherein the lower alkyl groups independently contain from one to four carbon atoms, inclusive, and 2,2,2-trichloro-1-hydroxyethyl, 4-cyanophenyl, 2,4,5-trichlorophenyl and 4-methylthiophenyl.

The compounds are useful as insecticides, animal contact and systemic parasiticides, herbicides and foliar fungi protectants. Representative compounds are: 3-[O,O-diethylphosphorothioyl] benzaldoxime; 3-[O-(O,O-diethylphosphorothioyl)]benzaldoximino-N'-methyl carbamate; 4[O-O,O-diethylphosphorothioyl)]-acetophenone oxime; 4-[0,0-diethylphosphorothioyl)]-acetophenoneoximino-N'-methyl carbamate; and 4-(O,O-diethylphosphorothioyl)-acetophenoneoximino acetate; 4-[0-(0,0-Diethylphosphorothioyl)]-benzaldoximino-N'-morpholinyl carbamate; 4-[0-(0,0-Diethylphosphorothioyl)]-benzaldoximino-N'-piperidyl carbamate; 4-[0,0-Diethylphosphorothioyl)]-benzaldoximino-N'-azepinocarbamate; 0-Ethyl-0-[4-(N'-methylcarbamyl-oximino)phenyl]-N-methylamido phosphorothioate; 4-[0,0-Diethylphosphorothioyl)]-benzaldoximino-N'-(β-N'', N''-diethylaminoethyl)-carbamate.

## 3,673,182

## NAPHTHOLACTAM-(1,8) BASIC DYESTUFFS

Alfred Brack, Leverkusen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

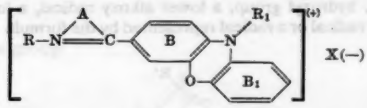
Filed Aug. 26, 1968, Ser. No. 755,448

Claims priority, application Germany, Sept. 4, 1967, P 15 69 606.7

Int. Cl. C07d 87/50

U.S. Cl. 260—242 12 Claims

Basic dyestuffs of the formula



are suitable for the dyeing, printing and bulk dyeing of synthetic and semisynthetic materials especially polyamides, acetate rayon and acid modified polyesters, leather, cocoa fibers, paper and jute, for the production of inks and paste for ball point pens, for use in offset printing, for use in dyeing, printing and bulk dyeing materials which completely or predominately consist of polymerized acrylonitrile and or vinylidene cyanide, the dyeings and prints on the last mentioned materials are characterized by outstanding fastness properties, especially fastness to light, wet processing, cross dyeing, decatizing, sublimation, exhaust fumes and rubbing. The dyestuffs are readily soluble, they yield deep dyeings, due to their high yield and very good drawing power and they do not soil wool. In the formula given above A denotes the residual members of a heterocyclic five or six membered ring to which further rings may be annelated, R is hydrogen, alkyl aralkyl, cycloalkyl or aryl, and R may also be linked to A or to another ring which is annelated to the ring containing A, $R_1$ is hydrogen, alkyl, aralkyl, cycloalkyl or aryl and $R_1$ may also be linked to B or $B_1$, and X is an anion.

## 3,673,183

## α-UREIDOCEPHALOSPORANIC ACID COMPOUNDS

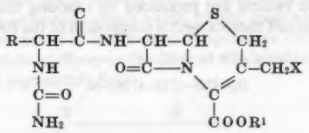
Raymond Curry Erickson, Metuchen, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

Filed Nov. 17, 1969, Ser. No. 877,488

Int. Cl. C07d 99/24

U.S. Cl. 260—243 C 7 Claims

New α-ureidocephalosporanic acid compounds of the general formula



are effective as antibacterial agents and show improved results against certain hard to control organisms.

## 3,673,184

## CERTAIN 2-SUBSTITUTED-5,8-DIHYDRO-5-OXOPYRIDO[2,3-D]PYRIMIDINE-6-CARBOXYLIC ACID DERIVATIVES

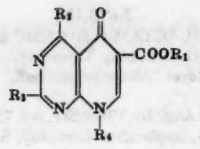
Shinsaku Minami, Kouriyama; Toshihiro Shono, Takatsuki; Masanao Shmmizu, Kobe, and Yoshiyuki Takase, Amagasaki, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 577,803, Sept. 8, 1966, abandoned. This application Sept. 2, 1970, Ser. No. 68,558

Int. Cl. C07d 57/20

U.S. Cl. 260—247.2 R 10 Claims

A 5,8-dihydro-5-oxopyrido [2,3-d] pyrimidine derivative represented by the following formula



wherein $R_1$ stands for hydrogen or a lower alkyl radical; $R_2$ stands for hydrogen, a lower alkyl radical, hydroxyl group, a halogen atom, a lower alkoxy radical, an amino radical or a lower alkylthio radical; $R_3$ stands for hydrogen, a lower alkyl radical, hydroxyl group, a lower alkoxy radical, a lower alkylthio radical or a radical represented by the formula

(wherein R′ stands for hydrogen, an alkyl radical, a cycloalkyl radical, an amino radical, a hydroxyalkyl group or an alkyl substituted amino alkyl radical, and R″ stands for hydrogen or an alkyl radical, R′ and R″ may be the same or a different radical and R′ and R″ may bond together to form a 5- or 6-membered heterocyclic ring containing a nitrogen hetero atom); and $R_4$ stands for hydrogen or an alkyl group. Such derivatives are useful as antibacterial agents.

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**3,673,185**

**KETONES OF THE THIAMINE SERIES AND THEIR PRODUCTION**

**Josef Klosa, Berlin, Germany, assignor to Fischer & Fischer GmbH, Baden, Germany**

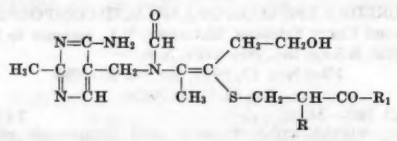
**Filed May 1, 1969, Ser. No. 821,077**

**Claims priority, application Germany, May 6, 1968, P 17 70 338.7**

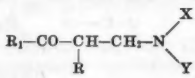
**Int. Cl. C07d *51/42***

**U.S. Cl. 260—256.5 B** **15 Claims**

5-mono-substituted ketones of the thiamine series having the formula:



wherein R is hydrogen or an alkyl radical and $R_1$ is an aryl or heterocyclic radical are produced by reacting thiamine or a mineral acid salt thereof with a compound of the formula:



wherein R and $R_1$ are as defined above and X and Y are independently selected from the group consisting of lower alkyl radicals.

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**3,673,186**

**N HYDROXY ALKYL-N′CYCLOALKYL PIPERAZINES**

**Henryk A. Cyba, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.**

**Continuation-in-part of Ser. No. 370,079, May 25, 1964, Pat. No. 3,446,808. This application May 21, 1969, Ser. No. 826,721**

**Int. Cl. C07d *51/70***

**U.S. Cl. 260—268 R** **4 Claims**

N-hydroxyalkyl-N′-hydrocarbyl saturated cyclic diazine or N-alkoxyalkyl-N′-hydrocarbyl saturated cyclic diazine in which said hydrocarbyl is sec-alkyl or cycloalkyl. The novel compound possesses utility as an additive to retard deterioration or organic substances due to weathering, oxidation, etc., and as a curing catalyst for urethanes.

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**3,673,187**

**BIS-(DIHYDROXYPHENYL-ETHYLOL)-SUBSTITUTED ALKYLENEDIAMINES AND THE SALTS THEREOF**

**Kurt Schromm; Anton Mentrup; Karl Zeile; Ernst-Otto Renth, all of Ingelheim/Rhine; Albrecht Engelhardt, Mainz, and Werner Traunecker, Munster-Sarmsheim, all of Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim/Rhine, Germany**

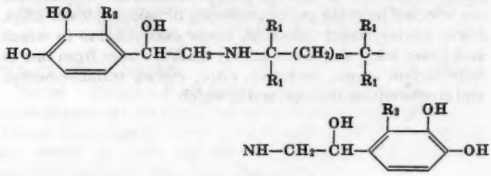
**Filed Dec. 2, 1969, Ser. No. 881,606**

**Claims priority, application Austria, Dec. 3, 1968, A 11776/68; Nov. 10, 1969, A 10533/69**

**Int. Cl. C07c *91/22*; C07d *57/36***

**U.S. Cl. 260—253** **9 Claims**

Compounds of the formula pipelines,



wherein

$R_1$ is hydrogen or methyl,

$R_2$ is methyl, methoxy, ethoxy or chlorine and, if $R_1$ is methyl, additionally hydrogen, and

*m* is a whole number from 0 to 10, inclusive, and their non-toxic, pharmacologically acceptable acid addition salts, useful as bronchial and uterine spasmolytics, antipruritics, vasodilators and antiallergics in warm-blooded animals.

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**3,673,188**

**HETEROCYCLIC AMIDOXIMES**

**Kalman Harsanyi; Kalman Takacs; Zsuzsa Relle nee Somfai; Eva Milak nee Krompecher; Laszlo Tardos; Dezso Korbonits; Pal Kiss, and Csaba Gonczy, all of Budapest, Hungary, assignors to CHINOIN Gyogyszer-es Vegyeszeti Termekek Gyara RT, Budapest, Hungary**

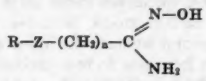
**Filed May 29, 1968, Ser. No. 732,845**

**Claims priority, application Hungary, June 6, 1967, CI-714**

**Int. Cl. C07d *35/14***

**U.S. Cl. 260—288 R** **1 Claim**

Novel compounds of the general formula



and salts thereof

wherein

R is a member of the group selected from indolyl, benzimidazolyl, benzoxazolyl, benztriazolyl, benzthiazolyl, indazolyl, benzisothiazolyl, pyrimidoimidazolyl, isoquinolinyl, isocarbostyrylyl, quinazolinyl, quinoxalinyl and benztriazinyl and substituted derivatives thereof; whereby the ring containing the heteroatom may be hydrogenated and whereby one or two carbon atoms of said ring may be bound exocyclically with two valence-bonds to an oxygen or sulphur atom of a carbonyl or thiocarbonyl group;

Z is a member of the group consisting of methylene and phenyl substituted methylene;

*n* is a number selected from the group consisting of 0, 1 and 2

which possess valuable therapeutical properties as anti phlogistics.

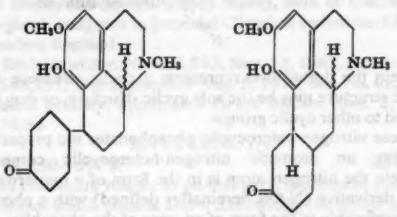
3,673,189

## TETRACYCLIC ISOQUINOLINE DERIVATIVES

William Vincent Curran, Pearl River, and Leon Goldman, Nanuet, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 5, 1971, Ser. No. 104,141
Int. Cl. C07d 39/00
U.S. Cl. 260—289 R 4 Claims

Compounds with the structure



are prepared from homologous intermediates and are useful as analgesic and antiinflammatory agents.

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3,673,190

## CHLORINATED PYRIDYLACETYLENE COMPOUNDS

James N. Selber, Davis, and Vernon D. Parker, Oakland, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 21, 1970, Ser. No. 4,757
Int. Cl. C07d 31/26
U.S. Cl. 260—290 HL 5 Claims

Trichlorovinylaromatic compounds having the general formula

Ar—(CCl CCl$_2$)hd p

wherein Ar is perchlorinated phenyl or perchlorinated pyridyl and

p is an integer of 1 to 3

are dehalogenated and reduced by electrolysis to give an aromatic acetylene compound having the general formula

Ar'—(C CH)$_p$

wherein Ar' is the original aromatic nucleus or the original aromatic nucleus containing fewer chlorine atoms. Such compounds are useful to control rice blast.

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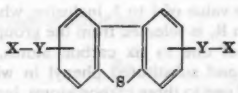
3,673,191

## BIS-BASIC ETHERS AND THIOETHERS OF DIBENZOTHIOPHENE

William L. Albrecht; Robert W. Fleming, and Stephen W. Horgan, all of Cincinnati, Ohio, assignors to Richards-Merrell, Inc., New York, N.Y.

Filed Feb. 18, 1970, Ser. No. 12,428
Int. Cl. C07d 29/36
U.S. Cl. 260—293.57 11 Claims

The novel bis-basic ethers and thioethers of dibenzothiophene of the present invention have useful antiviral properties. These new compounds are represented by the formula



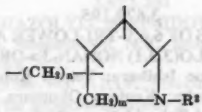
Formula I

wherein each Y is oxygen or divalent sulfur; and each X is

(A) the group

wherein each A is a straight or branched alkylene chain having from two to eight carbon atoms and which separates the amino nitrogen and Y by at least two carbon atoms; R and R$^1$ are individually hydrogen, (lower)alkyl having from one to six carbon atoms, cycloalkyl having from three to six carbon atoms, alkenyl having from three to six carbon atoms and having the vinyl unsaturation in other that the 1-position of the alkenyl group; or each set of R and R$^1$ taken together with the nitrogen atom to which they are attached is a saturated monocyclic heterocyclic group such as pyrrolidino, piperidino, morpholino, or N-(lower)alkylpiperazino; or

(B) the group



wherein *n* is a whole integer of from 0 to 2, *m* is 1 or 2, and R$^2$ is hydrogen, (lower)alkyl having from one to six carbon atoms, or alkenyl of from three to six carbon atoms and having the vinyl unsaturation in other than the 1-position of the alkenyl group.

This invention also includes pharmaceutically acceptable acid addition salts of the bases represented by Formula I. These new compounds may be prepared by several different methods which are described.

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3,673,192

## PROCESS FOR ALKYLATING PERYLENE PIGMENTS

John Herman Vander Ploeg, and Earl Weener, both of Holland, Mich., assignors to Chemetron Corporation, Chicago, Ill.

Filed Jan. 3, 1969, Ser. No. 788,921
Int. Cl. C07d 39/00
U.S. Cl. 260—281 10 Claims

A process for simultaneously alkylating and converting a non-pigmentary perylene containing an imido nitrogen group linked to two carbonyl groups to a pigment by reacting the compound with an alkylating agent in the presence of an alkali metal hydroxide and a binding agent. The binding agent is employed in an amount to effect a stiff, plastic mass and the reaction media is heated at an elevated temperature until the reaction is complete whereupon the desired alkylated compound is isolated in a pigmentary form.

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3,673,193

## 4-OXO-1,8-NAPHTHYRIDINE-3-CARBOXYLATES AND DERIVATIVES THEREOF

George Y. Lesher, Schodack, and Monte D. Gruett, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 399,333, Sept. 25, 1964, abandoned, Continuation-in-part of Ser. No. 244,886, Dec. 17, 1962, abandoned, Continuation-in-part of Ser. No. 79,951, Jan. 3, 1961, Pat. No. 3,149,104. This application May 11, 1970, Ser. No. 36,454
Int. Cl. C07d 31/36
U.S. Cl. 260—295.5 B 10 Claims

4-Oxo-1-substituted-1,8-naphthyridine-3-carboxylic acid derivatives, having antibacterial properties, prepared by !-alkylating corresponding 4-hydroxy-1,8-naphthyridine-3-carboxylic acid derivatives.

## 3,673,194
## DERIVATIVES OF 1,4,4A,9B-TETRAHYDRO-8,9B-DIMETHYL-2-PHENYL-1,4-ETHANOBENZOFURO [3,2-C]PYRIDINE-3(2H), 10-DIONE

**Elizabeth Benz Morlock, Bronx; Jay Donald Albright, and Leon Goldman, both of Nanuet, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.**

**Filed May 4, 1970, Ser. No. 34,614**
**Int. Cl. C07d *99/04***
**U.S. Cl. 260—293.55** **9 Claims**

This disclosure describes derivatives of 1,4,4a,9b-tetrahydro-8,9b-dimethyl-2-phenyl-1,4-ethanobenzofuro[3,2-c]-pyridine-3(2H),10-dione useful as antidepressant, anti-inflammatory, or analgetic agents.

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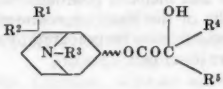
## 3,673,195
## DERIVATIVES OF 6,6,9-TRI-LOWER ALKYL-9-AZABICYCLO(3.3.1) NONAN-3α-OR 3β-OL

**Naoto Yoneda; Teruo Ishihara; Tetsuji Kobayashi; Yasuzo Kondo, all of Osaka; Kentaro Okumura, Kobe; Michio Kojima, Nara, and Takashi Nose, Osaka, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan**

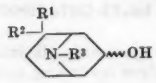
**Filed May 25, 1970, Ser. No. 40,394**
**Int. Cl. C07d *39/00, 99/06***
**U.S. Cl. 260—293.54** **14 Claims**

Compounds useful in treating Parkinson's disease have the general formula:

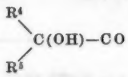


$R^1$, $R^2$ and $R^3$ are lower alkyl radicals. $R^4$ and $R^5$ are phenyl, cyclohexyl and thienyl radicals. Pharmaceutically acceptable acid addition salts of these compounds are also within the scope of the invention.

A 6,6,9-tri-lower alkyl-9-azabicyclo[3,3,1]nonan-3α and/or 3β-ol having the formula:



wherein $R^1$, $R^2$ and $R^3$ are as defined above is reacted with an acylating agent which may form an acyl radical having the formula:



wherein $R^4$ and $R^5$ are as defined above.

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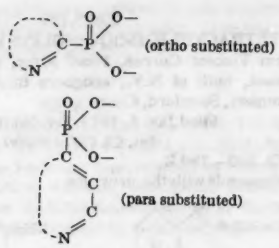
## 3,673,196
## PHOSPHONATES OF FULL AROMATIC NITROGEN HETEROCYCLICS

**Derek Redmore, Ballwin, Mo., assignor to Petrolite Corporation, Wilmington, Del.**

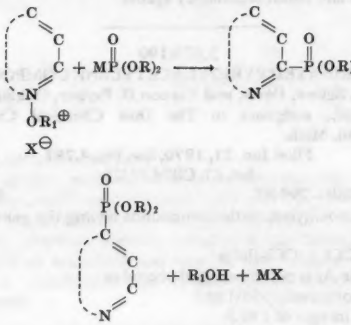
**Filed Feb. 24, 1969, Ser. No. 801,856**
**Int. Cl. C07d *31/46***
**U.S. Cl. 260—294.9** **7 Claims**

Nitrogen-heterocyclic phosphonates wherein the phosphonate group is ortho- or para- to the nitrogen heterocyclic group, where the compounds are characterized as follows:




wherein the dotted line represents a cyclic structure which cyclic structure may be the sole cyclic structure, or may be attached to other cyclic groups.

These nitrogen heterocyclic phosphonates are prepared by reacting an aromatic nitrogen-heterocyclic compound, wherein the nitrogen atom is in the form of a quaternary alkoxy derivative (N-OR hereinafter defined) with a phosphite salt, preferably in the form of an ester of the phosphite, as exemplified by the following equation:




These compounds which may be characterized as phosphonates of nitrogen-heterocyclics have many uses including their use as biocides, such as bacteriocides, herbicides, corrosion inhibitors, chelating agents, etc.

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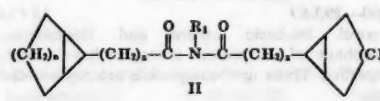
## 3,673,197
## EXO-DIBICYCLOALKANE CARBOXAMIDES

**Ronald H. Rynbrandt, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

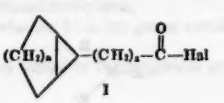
**Filed Jan. 14, 1971, Ser. No. 106,602**
**Int. Cl. C07d *31/44*; C07c *103/19***
**U.S. Cl. 260—295 AM** **4 Claims**

An exo-dibicycloalkanecarboxamide of the structural formula II:



II

wherein $n$ has the value of 1 to 3, inclusive; wherein $x$ is zero or 1; and wherein $R_1$ is selected from the group consisting of hydrogen, alkyl of one to six carbon atoms, inclusive, 2-pyridyl, phenyl, and substituted phenyl in which the substituent is alkyl of one to three carbon atoms, inclusive, alkoxy of one to three carbon atoms, inclusive, halogen, nitro or trifluoromethyl, is produced by reacting 2 molar equivalents of a formyl or acetyl exo-bicycloalkanecarbohalide of the formula I



I

wherein *n* and *x* are defined as above, and Hal is chlorine or bromine, with about 1 molar equivalent of an amine $H_2N$-$R_1$, in which $R_1$ is defined as above. Compounds II have antidiabetic activity and can be used in mammals to treat hyperglycemia.

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**3,673,198**

## CERTAIN PYRIDYL MALONATES

**Peter Doyle, and Joseph Gilbert Stacey, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England**

**Division of Ser. No. 682,593, Nov. 13, 1967, Pat. No. 3,546,237. This application Aug. 5, 1970, Ser. No. 61,404**

**Claims priority, application Great Britain, Dec. 2, 1966, 54,135/66**

**Int. Cl. C07d *31/42***

**U.S. Cl. 260—295 R** **3 Claims**

This disclosure relates to phenyl-pyridyl-alkanoic acids and derivatives which possess anti-inflammatory, analgesic and antipyretic activity, and which reduce the concentration of fibrinogen, cholesterol and triglycerides in blood. It also relates to processes for making said compounds, to pharmaceutical compositions, and to methods of treatment involving said compounds. A representative of said compounds is 6-(4-chlorophenyl)-2-methylpyrid-3-ylacetic acid.

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**3,673,199**

## MANUFACTURE OF BIPYRIDYLS

**Roy Dennis Bowden, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England**

**Filed April 22, 1970, Ser. No. 31,016**

**Claims priority, application Great Britain, May 9, 1969, 23,780/69**

**Int. Cl. C07d *31/42***

**U.S. Cl. 260—296 D** **9 Claims**

A process for the manufacture of bipyridyls which comprises heating a bipiperidyl or a substituted pyridine derivative wherein the substituent is a piperidyl group or an open-chain group containing one or more nitrogen atoms, in the vapour phase at a temperature of at least 200° C. in the presence of a dehydrogenation catalyst.

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**3,673,200**

## 3(2-SEC-BUTYL-4,6-DIMITROPHENOXY)-1,2-BENZISOTHIOZOLE 1,1-DIOXIDE

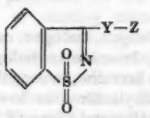
**Joseph W. Baker, and Gerald L. Bachman, both of Kirkwood, Mo., assignors to Monsanto Company, St. Louis, Mo.**

**Filed Jan. 2, 1970, Ser. No. 377**

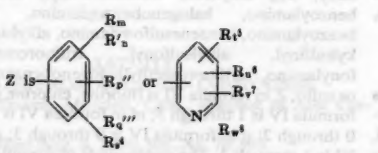
**Int. Cl. C07d *91/12***

**U.S. Cl. 260—301** **1 Claim**

Herbicidal compositions and methods with a substituted benzisothiazole - 1,1- dioxide of the formula:

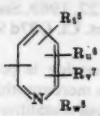


where Y is oxygen or sulfur and



in which R, R′, R″, R‴, $R^4$, $R^5$, $R^6$, $R^7$, and $R^8$ are independently selected from the group hydrogen, halo, nitro, cyano, alkyl, having a maximum of eight carbon atoms, aralkyl having a maximum of 14 carbon atoms, haloalkyl having a maximum of eight carbon atoms, and alkoxy having a minimum of five carbon atoms, m, n, p, q, s, t, u, v and w are integers of 0 or 1.

Compounds of the foregoing definition wherein the sum of m, n, p, q, and s is 2 or more and Z is



are new compounds.

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**3,673,201**

## THIAZOLYLCARBIMIDOYLUREAS

**Guy D. Diana, Stephentown, N.Y., assignor to Sterling Drug Inc., New York, N.Y.**

**Division of Ser. No. 711,192, March 7, 1968, Pat. No. 3,547,937. This application March 2, 1970, Ser. No. 15,905**

**Int. Cl. C07d *91/32***

**U.S. Cl. 260—302 R** **3 Claims**

This invention relates to carbimidoyl ureas which are prepared by reacting the appropriate isocyanates with the appropriate amidines. The compound possess anthelmintic activity.

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**3,673,202**

## 2,5-BIS(2-BENZAZOLYL)HYDROQUINONES AND THEIR DERIVATIVES

**Charles M. Orlando; Joseph G. Wirth, and Darrell R. Heath, all of Schenectady, N.Y., assignors to General Electric Company**

**Filed Jan. 7, 1970, Ser. No. 1,316**

**Int. Cl. C07d *91/44, 85/48, 49/38***

**U.S. Cl. 260—304** **10 Claims**

The subject compounds fluoresce in the visible and near-infrared regions of the spectrum when exposed to ultraviolet light. The particular color emitted (from blue to near-infrared) is dependent upon whether the hydrogen of the hydroxyl groups is present or has been replaced with various substituents, and upon the other hetero-atom in the benzazole ring. The compounds are photochemically and thermally stable and can be dissolved in organic solvents. They can be incorporated in various polymers to impart their fluorescent properties to the polymers which can be used to produce films, molded objects, or applied as coatings on the envelopes of ultraviolet lamps to produce various colored lights when energized.

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**3,673,203**

## 1,2,4-THIADIAZOLYL UREAS

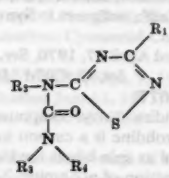
**Alfred H. Miller, Somerset, N.J., assignor to Esso Research and Engineering Company**

**Filed Oct. 22, 1969, Ser. No. 870,475**

**Int. Cl. C07d *91/60***

**U.S. Cl. 260—306.8 D** **5 Claims**

Ureas containing the 1,2,4-thiadiazolyl group and represented by the following structural formula have been found to possess utility as novel selective herbicides.



wherein $R_1$ is $C_4$—$C_8$ alkyl ro $C_7$—$C_8$ cycloalkyl; $R_2$ is H, methyl or ethyl; $R_3$ and $R_4$ are H or methyl or methoxy.

3,673,204

## MANUFACTURE OF N-2-ARYLTHIAZOLE SULFENAMIDE

James P. Shoffner, Elk Grove Village, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Aug. 22, 1969, Ser. No. 852,474
Int. Cl. C07d 91/44
U.S. Cl. 260—306.6 A 10 Claims

N-aryl-thiazolesulfenamide is prepared by oxidative condensation by reacting a mercaptothiazole and an aryl amine in alcohol solvent and alkali metal hypochlorite at a temperature below 0° C. The preferred N-aryl-2-benzothiazole sulfenamide is used to offset the decrease in scorch encountered upon incorporating a phenylenediamine antiozonant in the rubber formulation.

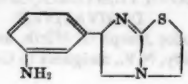
3,673,205

## 6-(M-AMINO AND SUBSTITUTED-AMINO PHENYL)-2,3,5,6-TETRAHYDRO[2,1-B]THIAZOLES AND METHOD OF USE

Larry Dean Spicer, Princeton, and John James Hand, Trenton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed March 25, 1970, Ser. No. 22,701
Int. Cl. C07d 91/18
U.S. Cl. 260—306.7 4 Claims

dl and l compounds of the formula:



and the pharmaceutically acceptable salts thereof. The invention also relates to a novel method for the preparation of these compounds and to the use of said compounds for treating helminthiasis in warm-blooded animals.

3,673,206

## RACEMIZATION OF d(+) 6-PHENYL-2,3,5,6-TETRAHYDROIMIDAZO [2,1-b]THIAZOLE

Milon Walker Bullock, Hopewell, and John James Hand, Trenton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 565,101, July 14, 1966, abandoned. This application April 2, 1969, Ser. No. 812,917
Int. Cl. C07d 99/10
U.S. Cl. 260—306.7 10 Claims

This invention describes a method of converting d(+) 6-phenyl-2,3,5,6-tetrahydroimidazo[2,1-b]thiazole into the corresponding dl compound. The latter compound is an active anthelmintic which can be resolved into the l(−) highly active component and d(+) inactive component.

3,673,207

## OXAZOLIDINE-3-OXYL DERIVATIVES

Harden M. McConnell, Stanford, and Edwin F. Ullman, Atherton, both of Calif., assignors to Synvar Associates, Palo Alto, Calif.

Filed April 17, 1970, Ser. No. 29,662
Int. Cl. C07d 85/26
U.S. Cl. 260—307 F 5 Claims

Novel oxazolidine-3-oxyl compounds, wherein the two-carbon of the oxazolidine is a carbon in the chain of oleic acid, which are useful as spin labels for biological membranes, are prepared by reaction of a 2-amino-2-lower alkyl-alkanol with an oxooleic acid, the resulting product oxidized to the corresponding oxazolidine-3-oxyl.

3,673,208

## MIXED ANHYDRIDES OF N-AROYL-1-(LOWER ALKYL)-5-NITRO-2-IMIDAZOLECARBOXIMIDIC ACID AND BENZOIC ACIDS

Christos George Papaloannou, Somerset, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed April 17, 1970, Ser. No. 29,653
Int. Cl. C07d 49/36
U.S. Cl. 260—309 9 Claims

This disclosure describes compounds of the class of mixed anhydrides of N-aroyl-1-(lower alkyl)-5-nitro-2-imidazolecarboximidic acid and a benzoic acid useful as intermediates for the preparation of certain antibacterial and antiprotozoal agents.

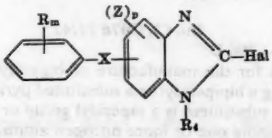
3,673,209

## BIOCIDALLY ACTIVE BENZIMIDAZOLE COMPOUNDS

Wilhelm Ernst Frick, Baselland; Anton G. Weiss, Basel; Thomas Wenger, and Walter Traber, both of Riehen, all of Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

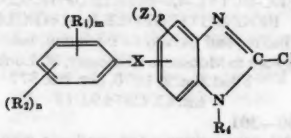
Division of Ser. No. 570,159, Aug. 4, 1966, Pat. No. 3,506,767. This application June 30, 1969, Ser. No. 851,524
Claims priority, application Switzerland, Aug. 6, 1965, 11111/65; Nov. 11, 1965, 11586/65; Jan. 5, 1966, 103/66
Int. Cl. C07d 49/38
U.S. Cl. 260—309.2 9 Claims

New benzimidazole compounds are disclosed which have biocidal activity. The compounds have the following structures:



(IV)

and



(VI)

wherein R is hydrogen, halogen or trifluoromethyl; $R_1$ is fluorine, chlorine, bromine or halogeno lower alkyl; $R_2$ is fluorine, chlorine, bromine, lower alkyl, lower alkoxy, lower alkylthio, lower alkylsulfinyl or lower alkyl sulfonyl; $R_4$ is hydrogen or an alkali metal cation; X is oxygen, sulfur, sulfinyl or sulfonyl; Z in formula IV is halogen, nitro, $C_{1-6}$ alkyl, $C_{1-6}$ alkoxy, $C_{1-6}$ alkylthio, trifluoromethyl, lower alkylamino, benzoylamino, halogenobenzoylamino, trifluoromethylbenzoylamino, benzenesulfonylamino, alkylsulfonylamino, alkylsulfinyl, alkylsulfonyl, trifluoromethylbenzenesulfonylamino, trifluoromethylhalogenobenzenesulfonylamino, or sulfo; Z in formula VI is fluorine, chlorine or bromine; m in formula IV is 1 through 5; m in formula VI is 0 through 3; n is 0 through 2; p in formula IV is 0 through 3; and p in formula VI is 1 through 3. The compounds of formula IV are particularly useful as insecticides and acaricides. The compounds of formula VI are particularly useful as insecticides, acaricides, bacteriostats and fungistats.

## 3,673,210

### N-(ω-CYANO-ALKYL)-CARBAMYL-BENZIMIDAZOLES

Werner Daum; Krefeld-Bockum; Hans Scheinpflug; Paul-Ernst Frohberger, both of Leverkusen, and Ferdinand Grewe, Burscheid, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 26, 1969, Ser. No. 880,399

Claims priority, application Germany, Nov. 30, 1968, P 18 12 005.3

Int. Cl. C07d *49/38*

U.S. Cl. 260—309.2 11 Claims

N-(ω-cyano-alkyl)-carbamyl-benzimidazoles, i.e., 2-(optionally alkoxy-carbonyl and alkyl-carbonyl)-3-[N-(ω-cyano-alkyl)-carbamyl]-4,5,6 and/or 7-(optionally alkyl)-benzimidazoles, which possess fungicidal, anti-bacterial, insecticidal, acaricidal and ovicidal properties and which may be produced by conventional methods.

## 3,673,211

### MANUFACTURE OF α,β-DIHALO-γ-HYDROXYCROTONIC LACTAMS

Ekkehard Winterfeldt, Berlin, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Land Rheinland-Pfalz, Germany

Filed March 18, 1969, Ser. No. 808,304

Claims priority, application Germany, March 23, 1968, P 17 70 042.4

Int. Cl. C07d *27/16*

U.S. Cl. 260—326.5 FL 6 Claims

Manufacture of α,β-dihalo-γ-hydroxycrotonic lactams by reacting mucohalogenic acid halides with primary amines, as well as the new α,β-dihalo-γ-hydroxycrotonic lactams themselves. The new products are valuable intermediates for the production of insecticides and fungicides.

## 3,673,212

### SUBSTITUTED PHENYLACETIC ACIDS AND ESTERS THEREOF

Rolf Denss, Basel, Switzerland; Niels Clauson-Kaas, Farum, Denmark, and Franz Ostermayer, Riehen, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

Division of Ser. No. 679,224, Oct. 30, 1967, Pat. No. 3,579,535. This application April 29, 1970, Ser. No. 43,637

Claims priority, application Switzerland, Oct. 31, 1966, 15768/66; Jan. 18, 1967, 713/67; Aug. 1, 1967, 11178/67

Int. Cl. C07d *27/26*

U.S. Cl. 260—326.3 4 Claims

Substituted phenyl acetic acids, addition salts thereof with bases as well as esters thereof, which compounds exhibit useful antiinflammatory (antiphlogistic), analgesic and antipyretic activity, and processes for the production of these compounds, as well as starting materials used in said processes; therapeutic compositions containing these compounds, and methods of treatment, particularly methods of inducing antiinflammatory, analgesic and antipyretic effects in mammals. Illustrative embodiments are 2-[p-(1-pyrryl)-phenyl]-butyric acid, [3-chloro-4-(1-pyrryl)-phenyl]-acetic acid and 2-[p-(1-pyrryl)-phenyl]-propionic acid methyl ester.

## 3,673,213

### INDOLOL PROSTAGLANDIN COMPOUNDS

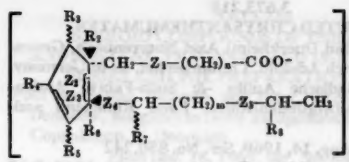
Alejandro Zaffaroni, Atherton, Calif., assignor to Alza Corporation

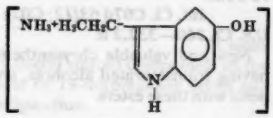
Filed Sept. 8, 1970, Ser. No. 70,392

Int. Cl. C07d *27/56*

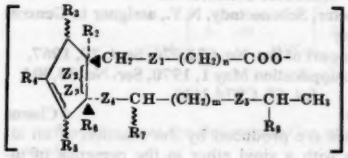
U.S. Cl. 260—326.14 R 18 Claims

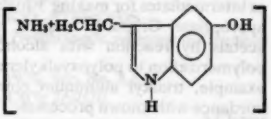
Novel compounds of the formulas:



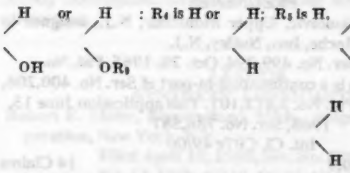


and





wherein $R_8$ and $R_9$ are hydrogen when $Z_2$ is a single bond and $Z_2$ is a double bond $R_2$ and $R_8$ are absent; $R_9$ is keto,



OH or $OR_9$; $R_8$ is H or OH; $R_9$ is acyl or alkoxyalkyl; $Z_1$ is $—CH_2CH_2—$ or cis—CH = CH—; $Z_2$ is a single or double bond; $Z_3$ is a single bond or a double bond and it is a double bond when $R_4$ and $R_5$ are hydrogen; $Z_4$ is $—CH_2CH_2—$ or trans —CH = CH—; $Z_5$ is $—CH_2CH_2—$ or cis—CH = CH—; n is 2 to 5 and *m* is 1 to 3. The compounds have improved biological stability and they can serve as a reservoir for prostaglandins that have biological activity, in that different prostaglandin compounds stimulate or inhibit smooth muscles, inhibit gastric secretion, lower or raise blood pressure, inhibit lipolysis and inhibit platelet aggregation.

## 3,673,214

### RING-E SUBSTITUTED 4-CYANO-3-SECOYOHIMBANES AND -CYANO-3-SECOALLOYOHIMBANES

Jay Donald Albright, and Leon Goldman, both of Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 758,593, Sept. 9, 1968, Pat. No. 3,576,004. This application Jan. 11, 1971, Ser. No. 105,641

Int. Cl. C07d *27/54*

U.S. Cl. 260—326.3 9 Claims

This disclosure describes compounds of the class of ring-E substituted 4-cyano-3-secoyohimbanes and 4-cyano-3-secoalloyohimbanes useful as analgesics, anti-inflammatory agents, and central nervous system depressants.

3,673,215

## SUBSTITUTED CHRYSANTHEMUMATES

Robert Vollrath, Bad Duerkheim; Axel Nuerrenbach, Gruenstadt, and Heinrich Adolphi, Limburgerhof, all of Germany, assignors to Badische Anilin -& Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Land Rhineland and-Pfalz, Germany

Filed Aug. 14, 1969, Ser. No. 850,242

Claims priority, application Germany, Aug. 29, 1968, P 17 93 312.9

Int. Cl. C07d *63/12*; C07c *69/74*; A61k *27/00*

U.S. Cl. 260—332.2 R 10 Claims

New and valuable chrysanthemumates, particularly esters having triunsaturated alcohols, and a process for controlling pests with these esters.

3,673,216

## ALKOXYOXETANES

Siegfried H. Schroeter, Schenectady, N.Y., assignor to General Electric Company

Continuation-in-part of Ser. No. 671,576, Sept. 29, 1967, abandoned. This application May 1, 1970, Ser. No. 33,904

Int. Cl. C07d *3/00*

U.S. Cl. 260—333 4 Claims

2-Alkoxyoxetanes are produced by the reaction of an aldehyde or ketone with a vinyl ether in the presence of ultraviolet light. The 2-alkoxyoxetanes produced in accordance with this invention are useful as plasticizers for organic resins, as intermediates for making 3-hydroxy-alkyl ethers utilizing an appropriate Grignard reagent, and 3-hydroxy substituted acetals by reaction with alcohols, and as monomers for polymerization to polyoxyalkylene compounds employing, for example, trialkyl aluminum compounds with water in accordance with known processes.

3,673,217

## SUBSTITUTED-DESA-PREGNANES AND DESA-PREGNENES

Milan Radoje Uskokovic, Upper Montclair, N.J., assignor to Hoffmann-La Roche, Inc., Nutley, N.J.

Division of Ser. No. 499,094, Oct. 20, 1965, Pat. No. 3,574,761, which is a continuation-in-part of Ser. No. 400,206, Sept. 29, 1964, Pat. No. 3,412,107. This application June 13, 1968, Ser. No. 736,587

Int. Cl. C07c *49/00*

U.S. Cl. 260—340.9 14 Claims

This invention is directed to substituted-desA-pregnanes and desA-pregnenes and derivatives thereof which are converted to known 9$\beta$,10$\alpha$-steroids of the pregnane series. The latter compounds are useful as both progestational agents and as salt-retaining agents.

3,673,218

## BICHROMONYL COMPOUNDS

Hugh Cairns, and Peter Bennett Johnson, both of Loughborough, England, assignors to Fisons Pharmaceuticals Limited, Loughborough, England

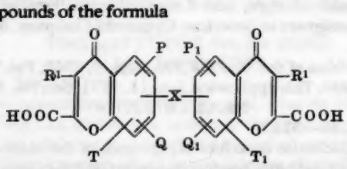
Filed Oct. 28, 1969, Ser. No. 871,972

Claims priority, application Great Britain, Oct. 30, 1968, 51,421/68

Int. Cl. C07d *7/34*

U.S. Cl. 260—345.2 34 Claims

Compounds of the formula



in which P to $T_1$ are hydrogen, alkyl, alkoxy, alkenyl, alkenyloxy, substituted alkyl, substituted alkoxy, substituted alkenyl, substituted alkenyloxy, amino, substituted amino aminoalkoxy, substituted aminoalkoxy, nitro, halo, hydroxy, or benzyloxy; the $R^1$ groups are hydrogen, substituted or unsubstituted alkyl, alkoxy or aryl; and X is a carbon - carbon bond or a single atom, which may be substituted, through which the chromone nuclei are linked, and pharmaceutically acceptable derivatives thereof, are indicated for use in the treatment of 'extrinsic' allergic asthma.

3,673,219

## 4-PHENYL 2-(2'-HYDROXY-META-TERPHENYL-5'-YL)-DIBENZOFURAN AND 4,4'-DIPHENYL-2,2'-BIDIBENZOFURAN

Allan S. Hay, Schenectady, N.Y., assignor to General Electric Company

Filed June 23, 1970, Ser. No. 49,196

Int. Cl. C07d *5/44*

U.S. Cl. 260—346.2 M 5 Claims

Heating 3,3',5,5'-tetraphenyldiphenoquinone above its melting point but below its carbonization temperature causes an intramolecular disproportionation reaction the progress of which is monitored by the color change. Three sexiphenyl compounds are produced which are separable by chromatography. Two of the products are new compounds, having one and two dibenzofuran groups, respectively in their structures. The bidibenzofuran compound can be converted to 5',5'' diphenyl-m-quaterphenyl-2,2'''-diol, useful in the preparation of polycarbonates and polyester. The other two products can be reworked to serve as a recycle feedstock.

3,673,220

## MANUFACTURE OF PYRANTHRONES

Gustav Bock, Neustadt, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Oct. 9, 1970, Ser. No. 79,681

Claims priority, application Germany, Oct. 14, 1969, P 19 51 708.9

Int. Cl. C09b *3/42*

U.S. Cl. 260—360 6 Claims

A new process for the manufacture of pyranthrones (I) from 2,2'-dialkyl-1,1'-dianthraquinonyls (II) by heating (II) at from 150° to 210° C. in polar organic solvents in the presence of alkali metal acetates.

3,673,221

## ACID ANTHRAQUINONE DYESTUFFS

Peter Hindermann, Bottmingen/Basel-Land, and Hubert Meindl, Riehen/Basel, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

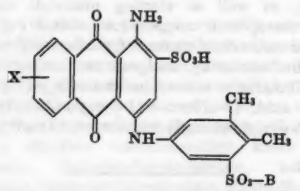
Filed Sept. 22, 1969, Ser. No. 860,042

Claims priority, application Switzerland, Oct. 3, 1968, 14804/68

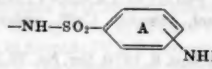
Int. Cl. C09b *1/30*

U.S. Cl. 260—374 7 Claims

Acid anthraquinone dyestuffs are disclosed which are the formula



wherein X is hydrogen or $SO_3\ominus M\oplus$ and B is —OH or



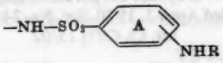
wherein R denotes hydrogen or lower alkyl and wherein any substituent of A other than NHR is selected from hydrogen,

halogen, lower alkyl or $SO_3^{\ominus}M^{\oplus}$, and $M^{\oplus}$ is one equivalent of a colorless cation.

These dyestuffs are useful for the dyeing and printing of organic materials especially materials made from natural and synthetic polyamide.

The resulting dyeings are distinguished by purity, good fastness to light, washing and perspiration.

The dyestuffs in which B represents




are moreover valuable as intermediate products for the production of fiber reactive dyestuffs for cellulose and polyamide material.

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**3,673,222**

**2-(8-CYCLOHEXYLOCTYL OR 7-CYCLOHEXYLHEPTYL)-1,4-NAPHTHOQUINONE AND PROCESS FOR PREPARATION AND USE THEREOF**

**Sydney Archer, 52 Wisconsin Ave., Delmar, N.Y., and Roman R. Lorenz, 3 Highland Drive, East Greenbush, N.Y.**

**Continuation-in-part of Ser. No. 589,202, Oct. 25, 1966, abandoned. This application Nov. 26, 1969, Ser. No. 880,371**

**Int. Cl. C07c *49/66***

**U.S. Cl. 260—396 R** **4 Claims**

Intermediates for the preparation of 2-hydroxy-3-(8-cyclohexyloctyl)-1,4-naphthoquinone and 2-hydroxy-3-(7-cyclohexylheptyl)-1,4-naphthoquinone, potent antimalarial agents, are prepared as follows: reacting 8-cyclohexyloctanoic acid or 7-cyclohexylheptanoic acid with 1-naphthol to form 2-(8-cyclohexyloctanoyl or 7-cyclohexylheptanoyl)-1-naphthol; reducing the 2-acyl-1-naphthol to form 2-(8-cyclohexyloctyl or 7-cyclohexylheptyl)-1-naphthol; oxidizing 2-(8-cyclohexyloctyl or 7-cyclohexylheptyl)-1-naphthol to form 2-(8-cyclohexyloctyl or 7-cyclohexylheptyl)-1,4-naphthoquinone; reacting the latter with a peroxide under alkaline conditions to form 2-(8-cyclohexyloctyl or 7-cyclohexylheptyl)-1,4-naphthoquinone-2,3-oxide; and, hydrolyzing the 2,3-oxide under acidic conditions to yield 2-hydroxy-3-(8-cyclohexyloctyl or 7-cyclohexylheptyl)-1,4-naphthoquinone.

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**3,673,223**

**6-THIOCYANATO-16-METHYLENE-4,6-PREGNADIENES, METHODS FOR THEIR MANUFACTURE, AND INTERMEDIATES THEREOF**

**Elliot L. Shapiro, Cedar Grove, N.J., assignor to Schering Corporation, Bloomfield, N.J.**

**Filed March 31, 1971, Ser. No. 129,949**

**Int. Cl. C07c *169/32***

**U.S. Cl. 260—397.4** **11 Claims**

6-Thiocyanato-16-methylene-17α-lower alkanoyloxy-4,6-pregnadiene-3,20-diones having progestational and anti-androgenic activities are prepared from 6β-thiocyanato-7α-hydroxy-16-methylene-17α-lower alkanoyloxy-4-pregnene-3,20-diones by treatment in a tertiary amine with a hydrocarbonsulfonyl halide having up to seven carbon atoms. The 6-thiocyanato-16-methylene-4,6-pregnadienes of this invention are also prepared by treating a 6β-thiocyanato-7α-hydroxy-16-methylene-17α-lower alkanoyloxy-4-pregnene-3,20-dione or a 7-lower alkanoate ester thereof with an acid selected from the group consisting of p-toluenesulfonic acid or hydrochloric acid in a non-reactive, organic solvent.

**3,673,224**

**STEROID COMPOUNDS OF THE ESTRANE, ANDROSTANE, PREGNANE AND 19-NORPREGNANE SERIES AND THE PREPARATION THEREOF**

**Poul Borrevang, Rodovre, and Peter Faarup, Soborg, both of Denmark, assignors to Novo Terapeutisk Laboratorium A/S, Copenhagen, N, Denmark**

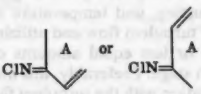
**Filed Dec. 16, 1969, Ser. No. 885,654**

**Claims priority, application Great Britain, Dec. 24, 1968, 61,413/68**

**Int. Cl. C07c *169/34***

**U.S. Cl. 260—397.4** **7 Claims**

Novel and therapeutically useful steroid compounds of the estrane, androstane, pregnane or 19-norpregnane series and having the partial ring A configuration:




as well as processes for the preparation of these steroid compounds.

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**3,673,225**

**NEW 7-ALKYL-STEROIDS**

**Hendrik Paul De Jongh, Oss, Netherlands, assignor to Organon Inc., West Orange, N.J.**

**Filed Jan. 16, 1970, Ser. No. 3,516**

**Int. Cl. C07c *169/20***

**U.S. Cl. 260—397.5** **3 Claims**

The present invention relates to a group of novel 7α,18-dialkyl-steroids of the oestrane series having a double bond originating from carbon atom 5, which compounds have strong oestrogenic, ovulation-inhibiting and antifertilization properties.

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**3,673,226**

**SYNTHETIC LUBRICANTS**

**Robert E. Malec, Birmingham, Mich., assignor to Ethyl Corporation, New York, N.Y.**

**Filed April 10, 1968, Ser. No. 720,358**

**Int. Cl. C07c *69/20, 69/32*; C11c *3/08***

**U.S. Cl. 260—410.6** **9 Claims**

Elimination of water from trimethylolpropane forms a mixture containing a substantial amount of di-trimethylolpropane. Esterification of the mixture with monobasic aliphatic carboxylic acids containing from about 2–12 carbon atoms such that the average acid chain is from 4–9 carbon atoms results in a synthetic ester lubricant especially useful for lubricating gas turbines.

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**3,673,227**

**SIMPLIFIED CONTINUOUS RENDERING SYSTEM**

**Jack G. Keith, Santa Fe Springs, Calif., assignor to Duke, Inc., Germantown, Ohio**

**Division of Ser. No. 586,292, Oct. 12, 1966, Pat. No. 3,506,407. This application Jan. 12, 1970, Ser. No. 2,142**

**Int. Cl. C11b *1/12***

**U.S. Cl. 260—412.6** **7 Claims**

A continuous process for the dry rendering of raw materials in the form of animal, poultry and fish byproducts to produce fat and tankage in which the raw materials are cooked to free the fats therefrom in a single cooking operation, the raw materials being reduced to a mean particle size and then cooked under controlled moisture and temperature conditions and maintained in the cooking vessel for a residence time at least equal to one hour flow rate of the materials through the cooker.

3,673,228

## PROCESS FOR ADSORBENT BLEACHING OF EDIBLE OILS

Ronald D. Harris, Wyoming, and Leon Levine, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sept. 4, 1969, Ser. No. 855,352
Int. Cl. C11b 3/10
U.S. Cl. 260—428 22 Claims

In a process for adsorbent bleaching of edible oils, adsorbent agent usage is reduced by deaerating and moisture adjusting an oil/adsorbent mixture, then adjusting the temperature of the mixture to range from 200° to 400° F and then directly passing the temperature-adjusted mixture through a bleaching zone at a pressure of atmospheric pressure or greater in the substantial absence of oxygen and under turbulent flow, and finally filtering the adsorbent from the oil. Adsorbent usage is also reduced by utilizing the above deaerating, moisture adjusting, and temperature conditions with or without the use of turbulent flow and utilizing 2 to 7 bleaching stages with more or less equal amounts of fresh adsorbent being used in each stage. Preferably, this multistage process is utilized in combination with the turbulent flow process.

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3,673,229

## METAL OXIDE ACYLATES AND THEIR PREPARATION

Jacobus Rinse, 77 Anderson Road, Bernardsville, N.J.

Continuation-in-part of Ser. No. 651,120, July 5, 1967, , Continuation-in-part of Ser. No. 840,604, July 7, 1967,. This application March 5, 1970, Ser. No. 16,990
Int. Cl. C07f 13/00, 11/00, 15/02
U.S. Cl. 260—429 R 4 Claims

Organic metal compounds containing a high percentage of metal and having a central molecular structure comprising two or three metal atoms connected by oxygen bonds to each other, at least one of the metals being trivalent, and, in turn, connected to two or three acyloxy groups or to three divalent-metal acyloxy groups are prepared by reacting metal acetates or formates with metal oxides or hydroxides and with an aliphatic acid having from 7-22 carbon atoms or with a divalent metal acyl oxide of such acid to form products useful as resin additives, fungicides, anti-corrosives and colorants.

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3,673,230

## METHOD OF PREPARING HEXAORGANODISTANNANES

Gerald H. Reifenberg, Highstown, and William J. Considine, Somerset, both of N.J., assignors to Mat Chemicals Inc., New York, N.Y.

Division of Ser. No. 773,329, Nov. 4, 1968. This application Jan. 18, 1971, Ser. No. 107,575
Int. Cl. C07f 7/22
U.S. Cl. 260—429.7 4 Claims

This invention is a method for preparing compounds of the formula $R_3SnSnR_3$ comprising pyrolyzing a triorganotin formate of the formula

wherein R is a hydrocarbon selected from the group consisting of alkyl, alkenyl, aralkyl, and cycloalkyl radicals, and separating $R_3SnSnR_3$.

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3,673,231

## SEC-PHOSPHINE DITHIOPHOSPHINIC ACID SALTS

Rupert C. Morris, Berkeley, and Ronald F. Mason, Mill Valley, both of Calif., assignors to Shell Oil Company, New York, N.Y.

Filed Aug. 13, 1970, Ser. No. 63,659
Int. Cl. C07f 3/06
U.S. Cl. 260—429.9 4 Claims

Zinc salts of hydrocarbyl-substituted or unsubstituted 9-phosphabicyclononane-9,9-dithiophosphinic acid, useful as lubricating oil additives, are prepared by contacting 9-H-9-phosphabicyclononane, optionally having one or more hydrocarbyl substituents on a ring carbon atoms, with sulfur in the presence of ammonium hydroxide, followed by treatment with a zinc salt.

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3,673,232

## DICYCLOPENTADIENYL IRON COMPOUNDS

Meldon L. Talbot, and Theodore T. Foster, both of Boulder, Colo., assignors to Syntex Corporation, Panama, Panama

Filed April 1, 1970, Ser. No. 24,863
Int. Cl. C07j 15/02
U.S. Cl. 260—439 CY 15 Claims

Production of dimers of dicyclopentadienyl iron compounds by the reaction of a dicyclopentadienyl iron compound and a ketonic coupling agent in the presence of an acid catalyst in an organic solvent. The process involves a two-phase system wherein one phase comprises said ketonic coupling agent, a strong acid, and a polar organic solvent; and the second phase comprises said iron compound which is slightly soluble in the first phase. The product dimers of dicyclopentadienyl iron compounds are useful as hematinic agents and in the cure of polymers. Those compounds substituted in at least one cyclopentadienyl ring are novel.

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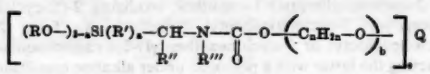
3,673,233

## SILYL-SUBSTITUTED CARBAMIC ACID DERIVATIVES

Hans Dietrich Golitz, Koeln-Stammheim, and Walter Simmler, Odenthal-Schlinghofen, both of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

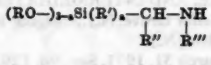
Filed Dec. 2, 1969, Ser. No. 881,622
Claims priority, application Germany, Dec. 4, 1968, P 18 12 564.9
Int. Cl. C07f 7/18
U.S. Cl. 260—448.2 N 6 Claims

New organosilyl-modified carbamic acid esters have the formula

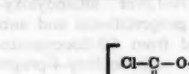


in which R, R′ and R‴ are monovalent hydrocarbon radicals, R″ is a hydrogen atom a methyl radical or a phenyl radical, Q is a monovalent to hexavalent hydrocarbon radical having up to 6 carbon atoms, *a* is 0, 1, 2 or 3, *n* is 2, 3 or 4, *b* is zero or an integer from 1 to 200, and *c* is the valency number of Q.

These carbamic acid derivates are prepared by reacting at a temperature of from 20° to 150° C., an aminomethyl-silane derivative of the formula



with a chloroformic acid ester of the formula



in the presence of a tertiary amine.

The products are to be used as priming agents imparting adhesion to synthetic resins on siliceous surfaces, as surfactants and as intermediates for organo-polysiloxane resins.

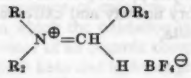
3,673,234

## PROCESS FOR PREPARING DIALKYLAMINOALKOXYCARBONIUM TETRAFLUOROBORATE

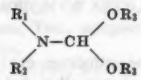
Kenji Ikawa, Osaka, and Fumitaka Takami, Higashiosaka, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed April 22, 1970, Ser. No. 30,932
Claims priority, application Japan, May 15, 1969, 44/37871
Int. Cl. C07c *119/16*
U.S. Cl. 260—453 R 3 Claims

Dialkylaminoalkoxycarbonium tetrafluoroborate of the formula:



wherein, $R_1$, $R_2$ and $R_3$ each represents a lower alkyl group, is prepared by reacting dialkylformamide and alkyl chloroformate with sodium fluoroborate. Furthermore, dialkylformamide dialkylacetal of the formula:



wherein, $R_1$, $R_2$ and $R_3$ are meanings the same meanings as above, is prepared by treating said dialkylaminoalkoxycarbonium tetrafluoroborate with sodium alcoholate.

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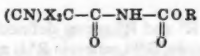
3,673,235

## ESTERS OF N-HALOCYANOACETYL CARBAMIC ACIDS

George A. Burk, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 14, 1970, Ser. No. 2,978
Int. Cl. C07c *121/16*
U.S. Cl. 260—465.4 6 Claims

Esters of N-halocyanoacetyl carbamic acids having the general formula



where each

X is independently H, Cl or Br where not more than one X is H, and

R is an alkyl of 1—10 carbon atoms

are useful as bactericides and fungicides.

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3,673,236

## BASICALLY SUBSTITUTED 1-CYANO-0-CARBAMOYL-FORMOXIMES

Hans Ulrich Brechbuhler, Basle, and Kurt Gubler, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 23, 1969, Ser. No. 844,163
Claims priority, application Switzerland, July 24, 1968, 11105/68
Int. Cl. C07c *121/30*, *121/42*
U.S. Cl. 260—465.4 10 Claims

New basically substituted 1-cyano-O-carbamoyl-formoximes are described as insecticides, acaricides and nematocides, which are distinguished from known carbamoyl-oximes by pronounced systemic insecticidal, acaricidal and nematocidal action. A typical compound is 1-diethylamino-O-(N'-methylcarbamoyl)-formoxime. Processes for the production of these compounds are described as well as pesticidal compositions containing these compounds as active substances.

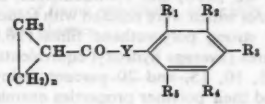
3,673,237

## 2,4-DINITRO-6-ALKYL PHENYL-CYCLOPROPIONATES

Stefan Janiak, Basel, Switzerland, assignor to Ciba Limited, Basel, Switzerland

Filed March 10, 1969, Ser. No. 805,849
Claims priority, application Switzerland, March 14, 1968, 3767/68
Int. Cl. C07c *69/74*
U.S. Cl. 260—468 P 7 Claims

It has been found that cycloalkyl carboxylic acid esters of the general formula



wherein *n* denotes one of the numbers 1, 2 or 3, Y represents oxygen or sulphur and $R_1$, $R_2$, $R_3$, $R_4$ and $R_5$ each represents hydrogen or various substituents possess biocidal activity, preferably for combatting weeds, members of the class Arachnoidea and bacteria and fungi.

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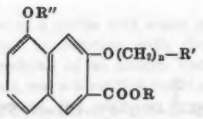
3,673,238

## 2-NAPHTHOIC ACID DERIVATIVES

Bill Elpern, White Plains; Harris J. Shapiro; James R. Shroff, both of Bronx, and Harold Soloway, New Rochelle, all of N.Y., assignors to USV Pharmaceutical Corporation

Filed Feb. 10, 1970, Ser. No. 10,294
Int. Cl. C07c *101/42*
U.S. Cl. 260—471 A 11 Claims

Napthoic acid derivatives of the formula



where R is lower alkyl, R' is a secondary amino group and R'' is hydrogen, phenyl-lower alkyl, or substituted phenyl-lower alkyl have hypotensive activity.

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3,673,239

## PROCESS FOR MANUFACTURING 3,3,5-TRIMETHYLCYCLOHEXYL MANDELATE

Hiroshi Takahashi, Arai, Japan, assignor to Daicel Ltd., Osaka, Japan

Filed Dec. 10, 1970, Ser. No. 97,048
Claims priority, application Japan, Dec. 16, 1969, 44/101145
Int. Cl. C07c *69/76*
U.S. Cl. 260—473 A 7 Claims

A process for manufacturing 3,3,5-trimethylcyclohexyl mandelate in which mandelic acid is esterified with 3,3,5-trimethylcyclohexanol in an inert solvent in the presence of an acid catalyst, in which a metal (Zn, Sn, Mg, Ni or Pb) is added to the reaction system at the beginning of or during the reaction, or afterwards, to generate ketone-reductive hydrogen in situ in order to minimize formation of 3,3,5-trimethylcyclohexylphenylglyoxylate.

## 3,673,240
## HYDROXYL-TERMINATED HYDROXYMETHYLABIETANYL ADIPATE

John B. Lewis, and Glen W. Hedrick, both of Lake City, Fla., assignors to The United States of America as represented by the Secretary of Agriculture

Filed May 12, 1970, Ser. No. 36,673
Int. Cl. C07c *69/44*
U.S. Cl. 260—485 G 1 Claim

Ethylene glycol adipic acid polyester was modified by incorporating the naval stores derived 12-hydroxymethyitetrahydroabietanol in the polyester chain. The modified polyester was blended with a poly (ethylene adipate) glycol (mol. wt. 2000) and 1,4-butanediol, $Bu(OH)_2$, giving glycol mixtures which were reacted with toluene diisocyanate TD1. Clear strong polyurethane films (26.6% TDI) from glycol mixtures (average hydroxyl equivalents, OHE, of 252) containing 5, 10, 15, and 20 percent resinyl moiety were prepared and their polymer properties examined. Incorporation of the moiety gave strength, toughness, and stiffness to films which otherwise would have been soft and tacky. Glycol mixtures having higher hydroxyl equivalent values required less isocyanate and addition of the resinyl glycol gave strong elastic films from a composition containing 16.6% TDI.

Experimental data suggests that use of the bulky 12-hydroxymethyltetrahydroabietanol may be an important contribution to polyurethane technology.

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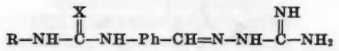
## 3,673,241
## SUBSTITUTED BENZALDEHYDE GUANYLHYDRAZONES

Adrian Marxer, Binningen, Switzerland, assignor to Ciba Corporation, Summit, N.J.

Filed March 25, 1969, Ser. No. 810,386
Claims priority, application Switzerland, April 4, 1968, 4998/68; Feb. 21, 1969, 2682/69
Int. Cl. C07c *127/16, 129/08, 133/10*
U.S. Cl. 260—501.12 14 Claims

Compounds of the formula



in which R represents an optionally substituted hydrocarbon radical, X represents oxygen or sulphur and Ph a phenylene radical, are useful for the treatment of cardiac insuffiency and as antihypertensive agents.

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## 3,673,242
## SULFONIC ACID BETAINES

Heinrich Rinkler, Dormagen; Rudolf Braden, Leverkusen-Schlebusch, and Gunther Nischk, Dormagen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 588,729, Oct. 24, 1966. This application Jan. 6, 1970, Ser. No. 512
Claims priority, application Germany, Nov. 2, 1965, F 47575
Int. Cl. C07c *143/52*
U.S. Cl. 260—507 R 3 Claims

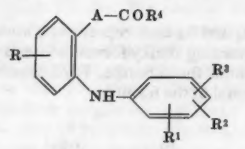
Unsaturated sulfonic acid betaines suitable for use as antistatic agents with high polymers are prepared by reacting an unsaturated N,N-disubstituted acid hydrazide with a sultone.

## 3,673,243
## NOVEL PROCESS FOR PRODUCING O-ANILINOPHENYLALIPHATIC ACID DERIVATIVES

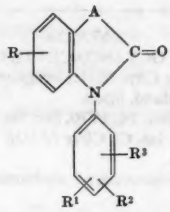
Hisao Yamamoto, Nishinomiya-shi; Atsuko Hirohashi, Ashiya-shi; Takahiro Izumi, Takarazuka-shi, and Masao Koshiba, Minoo-shi, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed May 2, 1969, Ser. No. 821,494
Claims priority, application Japan, May 8, 1968, 43/31141; May 13, 1968, 43/32406; May 15, 1968, 43/33113
Int. Cl. C07c *101/44*
U.S. Cl. 260—518 R 4 Claims

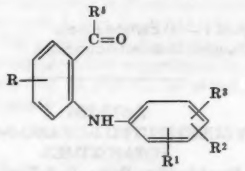
o-Anilinophenylaliphatic acid derivatives being excellent in anti-inflammatory activity and extremely low in toxicity and having the formula,



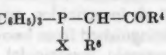
wherein A is vinylene, ethylene, etc.; R, $R^1$, $R^2$, and $R^3$ is hydrogen, halogen or lower alkyl, halogen-substituted lower alkyl or lower alkoxy; and $R^4$ is hydroxyl or lower alkoxy, are produced advantageously by contacting carbostyryl derivative of the formula,



where A, R, $R^1$, $R^2$ and $R^3$ are as defined above, with compound of the formula, $R^4H$, wherein $R^4$ is as defined above, or contacting benzenecarbonyl derivative of the formula,



wherein R, $R^1$, $R^2$ and $R^3$ are as defined above, and $R^5$ is hydrogen or lower alkyl in the presence of an alkali, with triphenyl-alkoxycarbonylmethylphosphonium halide of the formula,



wherein $R^4$ is as defined above; $R^6$ is hydrogen or lower alkyl; and X is halogen, and if necessary, further contacting the obtained o-cinnamic acid derivative with hydrogen.

3,673,244

## METHOD OF PRODUCING AROMATIC CARBOXYLIC ACIDS FROM ALKYLBENZENES

Cesare Reni, Busto Arsizio; Luigi Lugo, Milan, and Giorgio Gualdi, Verona, all of Italy, assignors to Societa' Italiana Resine S.p.A., Milan, Italy

Filed June 30, 1970, Ser. No. 51,364
Claims priority, application Italy, July 7, 1969, 19283 A/69
Int. Cl. C07c *63/02*
U.S. Cl. 260—524 R 12 Claims

A process for the preparation of aromatic carboxylic acids by the oxidation of alkyl benzenes with oxygen or gases containing molecular oxygen in an aliphatic carboxylic acid environment and in the presence of catalysts consisting of the salts of heavy metals in which the oxidation is carried out in the presence as an activator of an organic compound in which the molecule contains both keto and hydroxy groups.

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3,673,245

## TREATMENT OF OFF-GASES FROM NITRIC ACID OXIDATION OF ANOLONE

Samuel S. Mims, Odessa, Tex., assignor to El Paso Products Company, Odessa, Tex.

Filed Sept. 3, 1969, Ser. No. 855,013
Int. Cl. C07c *51/18*
U.S. Cl. 260—531 R 11 Claims

Off-gases, obtained from the nitric acid oxidation of an organic feed comprising cyclohexanol and cyclohexanone and mixtures thereof by contact in a reactor with nitric acid at an elevated temperature whereby adipic acid is produced, the mixture of off-gases comprising nitric oxide, nitrogen dioxide, other oxides of nitrogen, carbon dioxide, nitrogen and carbon monoxide, are mixed with an oxygen-containing gas and the resultant mixture is passed through the organic feed being passed to the nitric acid reactor. This results in utilizing all reactive oxidizing agents in the off-gases and transferring a portion of the highly exothermic reaction from the main reactor to the off-gas scrubber.

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3,673,246

## PROCESS FOR THE PRODUCTION OF TRICHLOROMETHANE-SULFENYL CHLORIDE

Gerhard Meyer, Obernburg; Helmut Magerlein, and Hans-Dieter Rupp, both of Erlenbach, all of Germany, assignors to Glanzstoff AG, Wuppertal, Germany

Filed Jan. 2, 1970, Ser. No. 5
Int. Cl. C07c *145/00*
U.S. Cl. 260—543 H 10 Claims

Process for producing trichloromethane-sulfenyl chloride ($CCl_3SCl$) wherein carbon disulfide is reacted with chlorine on activated carbon at temperatures of about −5° C. to +100° C.

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3,673,247

## HYDROXYBENZENSULFONYL HALIDE PRODUCTION

Harold Wayne Hill, Jr., and Robert W. Campbell, both of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed March 11, 1969, Ser. No. 806,281
Int. Cl. C07c *143/70*
U.S. Cl. 260—543 R 7 Claims

The conversion of hydroxybenzenesulfonates to the corresponding hydroxybenzenesulfonyl halides by contacting with a thionyl halide, a phosphorus oxyhalide or a carbonyl halide in the presence of catalytic amounts of selected organic phosphorus compound.

3,673,248

## PRODUCTION OF 1,3,4-DIAZAPHOSPHOLANES

Harro Petersen, Frankenthal, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Dec. 5, 1969, Ser. No. 882,711
Claims priority, application Germany, Dec. 18, 1968, P 18 13 648.6
Int. Cl. C07f *9/44*
U.S. Cl. 260—543 PN 8 Claims

Production of 1,3,4-diazaphospholanes by reaction of a N-methylolurea or a N-mercaptomethylurea compound with a phosphorus trihalide, and the new 1,3,4-diazaphospholanes themselves which are flame retardants and starting materials for the production of flame retardants, especially for textiles, surface coatings and plastics.

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3,673,249

## PROCESS FOR PREPARING TERTIARY AMYL UREA

Frank Meritt Furman, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed June 9, 1970, Ser. No. 44,898
Int. Cl. C07c *127/14*
U.S. Cl. 260—553 R 3 Claims

This disclosure describes a process for the preparation of tertiary amyl urea which is useful as an intermediate in the preparation of 1-cyano-3-tert.-amylguanidine, a hypotensive agent.

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3,673,250

## CATALYTIC HYDRATION OF NITRILES TO PRODUCE AMIDES

Francis Clyde Rauch, and Guenter Willi Nachtigall, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 1, 1970, Ser. No. 94,196
Int. Cl. C07c *103/00*
U.S. Cl. 260—561 N 16 Claims

Catalytic hydration of a nitrile with water in presence of a homogeneous catalyst in solution with the reactants, is described for the synthesis of an amide. The catalyst comprises two components, one a transition metal compound such as a rhodium compound, the other an organic phosphite, phosphine, arsenite, arsine, stibine or antimonite. One preferred example is rhodium trichloride with triphenyl phosphine as a catalyst for hydration of acrylonitrile to acrylamide. Some complexing of the solution components is suggested. In some embodiments, presence of a further component such as triphenyl phosphine oxide will improve the process.

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3,673,251

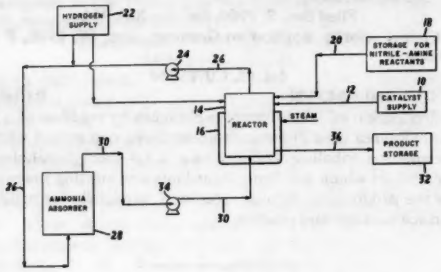
## PROCESS FOR THE CATALYTIC REDUCTIVE AMINATION OF NITRILES

Orville D. Frampton, Wyoming, Ohio; Joel B. Pedigo, Wheaton, Ill., and Hans Z. Lecher, Plainfield, N.J., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed April 30, 1969, Ser. No. 820,432
Int. Cl. C07c *85/12*
U.S. Cl. 260—563 D 17 Claims

A cyclic process is provided for preparing secondary and/or tertiary mono-, di- or polyamines by the continuous catalytic reductive amination of mono-, di- or polynitriles, which comprises continuously hydrogenating the nitrile in the presence of a hydrogenation catalyst and a primary or a secondary mono-, di- or polyamine reactant, removing the gaseous byproduct mixture, which consists of ammonia, unreacted

hydrogen and volatilized primary or secondary amine reactant, from the reaction mixture, separating the ammonia from




the gaseous by-product mixture by selective absorption, and recycling the hydrogen and amine reactant.

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## 3,673,252
## POLYCHLORO AMIDINES AND PROCESS FOR PREPARING THEM

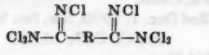
**Clifford L. Coon, Fremont, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.**

**Continuation-in-part of Ser. No. 671,615, Sept. 29, 1967, abandoned. This application Dec. 10, 1970, Ser. No. 96,979**

**Int. Cl. C07c *123/00***

**U.S. Cl. 260—564 R** **3 Claims**

The invention comprises a certain novel class of polychlorinated amidines, more specifically, polychlorinated bis(amidines) useful as chlorinating agents, bleaches, disinfectants, insecticides, and fungicides. The specific class of the subject novel compounds comprises the bis(polychloroamidines) having the structural formula



(in which R is an unsubstituted divalent hydrocarbyl radical defined more fully hereinbelow) produced, for example, by treating the corresponding bis(amidines) with sodium hypochlorite under acid conditions, or an aqueous solution of a bis(amidine) hypochloride and excess chloride with fluorine, preferably diluted with nitrogen.

Still another method involves the treatment of an acidic solution of the bis(amidines) of the class set forth herein with gaseous chlorine, this treatment being effected preferably at ambient temperatures and pressures.

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## 3,673,253
## PROCESS FOR THE PRODUCTION OF AMINOGUANIDINE BICARBONATE

**Peter Simons, Bergisch Gladbach, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany**

**Filed Feb. 21, 1968, Ser. No. 707,320**

**Claims priority, application Germany, Feb. 24, 1967, F 51627**

**Int. Cl. C07c *133/10***

**U.S. Cl. 260—564 F** **5 Claims**

Production of aminoguanidine bicarbonate by reacting finely divided solid calcium cyanamide with hydrazine, in the form of mono or dihydrazine sulfate or hydrazine hydrate and sulfuric acid in admixture, in neutral to alkaline aqueous medium, e.g. at pH 7 to about 9.5 and about 15°–90° C, using sulfuric acid for pH adjustment to form aminoguanidine, cooling the reaction mixture, e.g. to about 60°–40° C, to precipitate the resultant calcium sulfate sludge, and treating the sludge-free resultant reaction mixture, e.g. at 25°–50° C, with a bicarbonate precipitating agent, e.g. alkali metal or ammonium bicarbonate or carbon dioxide and alkali metal or ammonium hydroxide, to precipitate the aminoguanidine bicarbonate therefrom;

optionally avoiding iron contamination of the desired product by either adjusting to acid pH, e.g. pH 3–4, the reaction mixture prior to bicarbonate agent treatment to maintain such iron in soluble form, e.g. when Fe content low, or adjusting to about pH 7.5–8.5 the reaction mixture prior to bicarbonate agent treatment followed by air introduction, e.g. at 60°–45° C, to remove the iron content, e.g. when Fe content high-up to about 5 percent, as ferric hydroxide precipitate, the latter alternative being optionally carried out prior to calcium sulfate sludge precipitation (i.e. removal) to effect joint precipitation of such ferric hydroxide and sludge prior to bicarbonate treatment.

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## 3,673,254
## PROCESS FOR THE PRODUCTION OF 2-CHLOROALKYL-(OR CYCLOALKYL)-ISOCYANIDE DICHLORIDES

**Dieter Arlt, Cologne, Buchheim, and Hans Holtschmidt, Leverkusen-Schlebusch, both of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany**

**Filed June 17, 1968, Ser. No. 737,370**

**Claims priority, application Germany, Aug. 7, 1967, F 53/59**

**Int. Cl. C07c *119/00***

**U.S. Cl. 260—566 D** **6 Claims**

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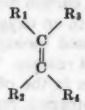
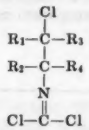
Production of 2-chloro-alkyl-(or cycloalkyl or aromatic)-isocyanide dichlorides by reacting an olefin of the formula



in which $R_1$ to $R_4$ each individually is hydrogen, alkyl, cycloalkyl, aromatic having up to 10 carbon atoms, or such radicals optionally substituted with $NO_2$, halo, or alkoxy, or $R_1$ and $R_2$ together with the

group form an alicyclic ring system optionally containing an $-SO_2-$group with hydrocyanic acid and with a chlorine-contributing compound, e.g. chlorine or sulfuryl chloride, in an amount at least equivalent to the sum total of the quantities of olefin and hydrocyanic acid used, e.g. at a temperature of about −10° to +40° C; the produced isocyanide dichlorides having the corresponding formula



in which $R_1$ to $R_4$ are the same as defined above, including -N = $CCl_2$ as optional further substituent for said substituted radicals, and being usable as intermediates for producing plastics auxiliaries, or directly for the production of isocyanates which optionally may be converted in turn with amines into ureas in the known manner, or directly as plant protection agents.

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## ERRATUM

For Class 260—571 see:
Patent No. 3,673,123

3,673,255

## CATALYTIC OXIDATIVE DEHYDROGENATION OF KETONES WITH IMPROVED SUPPORTED GOLD CATALYST

Robert W. Etherington, Jr., Pennington, and Koei-Liang Liauw, Murray Hill, both of N.J., assignors to Mobil Oil Corporation

Continuation-in-part of Ser. No. 711,864, March 11, 1968, Pat. No. 3,476,808, which is a continuation-in-part of Ser. No. 639,029, May 17, 1967, abandoned. This application Nov. 3, 1969, Ser. No. 873,705

Int. Cl. C07c *45/00*

U.S. Cl. 260—586 R 3 Claims

An improvement is provided in a process in which ketones and mixtures of ketones and alcohols having at lest one pair of hydrogen atoms on the alpha and beta carbon atoms are oxidatively dehydrogenated to the corresponding ethylenically unsaturated ketone by contacting the ketone and molecular oxygen-containing gas with a catalyst containing a metal of Group IB (Cu, Ag, Au) in the vapor phase (400°–750°C.). The catalyst can be a Group IB metal or oxysalt and can be on a support. Gold and supported gold catalysts are particularly preferred. The improvement is in obtaining high selectivity by the use of a supported gold catalyst (1–50 percent gold) in which the support is a clear, transparent, single crystal alpha-alumina having at least 50 percent and preferably 75 percent of its surface area covered with gold.

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3,673,256

## 3-ENDO-METHYL-3-EXO(4′-METHYLPENTANALYL)-2-METHYLENEBICYCLO[2.2.1HEPTANE AND PROCESS FOR PREPARING SAME

Kenneth M. Pieper, West Chester, and Thomas W. Gibson, Colerain Township, Hamilton County, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sept. 3, 1969, Ser. No. 855,043

Int. Cl. C07c *47/38*

U.S. Cl. 260—598 6 Claims

The compound, 3-endo-methyl-3-exo(4′-methylpentanalyl)-2-methylenebicyclo[2.2.1]heptane, and a process for preparing this compound are disclosed. 3-endo-Methyl-3-exo(4′-methylpentanalyl)-2-methylenebicyclo[2.2.1]heptane is valuable as a perfume component.

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3,673,257

## PROCESS FOR THE PRODUCTION OF AROMATIC HYDROXYALDEHYDES

Eugene P. Di Bella, Rochelle Park, N.J., assignor to Tenneco Chemicals, Inc.

Filed Feb. 2, 1970, Ser. No. 8,029

Int. Cl. C07c *45/16*

U.S. Cl. 260—600 15 Claims

Salicylaldehyde and other hydroxybenzaldehydes are prepared by the oxidation of a hydroxybenzyl alcohol in the presence of a platinum catalyst and a cationic oxidation promoter. Among the most effective oxidation promoters are cadmium, cerium, indium, and lanthanum ions.

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3,673,258

## PRODUCTION OF 2,2,4-TRIMETHYL-3-HYDROXYPENTANAL

Franz Merger, 8 Homburger Strasse, 6700 Ludwigshafen; Rolf Platz, 5 Hansastrasse, 6800 Mannheim, and Erich Nebe, 145 Rohrbacher Strasse, 6900 Heidelberg, all of Germany

Filed Dec. 27, 1968, Ser. No. 787,610

Int. Cl. C07c *47/02*

U.S. Cl. 260—602 6 Claims

Production of 2,2,4-trimethyl-3-hydroxypentanal by dimerization of isobutyraldehyde in the presence of a basic ion exchanger. The product is a valuable intermediate for the production of polyesters and plasticizers.

3,673,259

## PRODUCTION OF AROMATIC SULFONES

Jacob Rosin, Maplewood, and Frank S. Ang, Kearney, both of N.J., assignors to Chris-Craft Industries, Inc.

Filed Oct. 7, 1968, Ser. No. 765,594

Int. Cl. C07c *147/06*

U.S. Cl. 260—607 A 5 Claims

In the production of aromatic sulfones by the condensation reaction of an arylsulfonyl chloride with an arene, practically quantitative yields of the aromatic sulfone are obtained without the usual purification and work-up problems by conducting the condensation reaction in the presence of relatively large amounts (based on the molar concentration of the arylsulfonyl chloride) of the particular arylsulfonic acid which corresponds to such arylsulfonyl chloride, but substantially in the absence of any metal salts. Using in conjunction with this improved method for producing the aromatic sulfone a new and unique technique for producing the arylsulfonyl chloride, which technique is based on chlorinating the aromatic sulfonic acid with chlorosulfonic acid in the presence of certain organic solvents so that equilibrium of such chlorination is displaced toward formation of the resultant arylsulfonyl chloride, an extremely efficient process has been developed for the production of aromatic sulfones.

This process is described in detail in connection with the production of bis-(p-chlorophenyl) sulfone, which is a commercially important monomer in the manufacture of many thermoplastic polysulfone polymers.

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3,673,260

## HALOGENATED THIOETHERS AND METHOD OF PREPARATIONS

Christian Esclamadon, Les Chenes, France, assignor to Societe Anonyme dite: Societe Nationale des Petroles D'Aquitaine Courbevoie

Filed May 20, 1969, Ser. No. 826,291

Claims priority, application France, May 21, 1968, 68152543; May 21, 1968, 68152544

Int. Cl. C07c *149/00, 149/18*

U.S. Cl. 260—609 A 21 Claims

New halogenated thioether compounds of the general formula $R(S—CH_2—CHY—CH_2X)_n$ in which X represents a halogen atom, Y represents a hydrogen atom or a hydroxyl group, R is a mono or divalent cyclic or acyclic unsaturated hydrocarbon residue having up to 20 carbon atoms and *n* is 1 or 2 according to whether R is mono or divalent, are prepared by reacting thietane (thiacyclobutane or trimethylene sulphide) or 3-hydroxy thietane with a double-bonded halogen-substituted hydrocarbon derivative. By means of treatment with an aqueous solution of a base, the new thioether compounds in which Y is hydroxyl may be used to prepare corresponding new 2,3-epoxythiopropyl and bis(2,3-epoxy-thiopropyl) compounds.

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3,673,261

## PERFUME COMPOUNDS AND PROCESS FOR PREPARING SAME

Herbert C. Kretschmar, Greenhills, and William F. Erman, Springfield Township, Hamilton County, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 12, 1969, Ser. No. 884,686

Int. Cl. C07c *27/00, 35/22*

U.S. Cl. 260—617 F 6 Claims

The compounds 2-methylene-3-exo(trans-4′-methyl-5′-hydroxypent-3′-enyl)bicyclo[2.2.1]heptane, 2-methylene-3-exo-(cis-4′-methyl-5′-hydroxypent-3′-enyl)bicyclo[2.2.1] heptane and 2-methylene-3-exo(4′-methyl-5′-hydroxypentyl)bicyclo[2.2.1]-heptane, all of which are useful as perfumes, and processes for their preparation are disclosed.

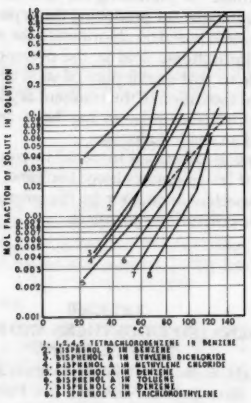
## 3,673,262
## CRYSTALLIZATION OF DIPHENYLOL ALKANES

Walter H. Prahl, Karlsruhe, Germany, and Sol J. Lederman, Kenmore, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 177,078, March 2, 1962, abandoned, and a continuation-in-part of Ser. No. 569,541, May 31, 1966, abandoned. This application Dec. 20, 1968, Ser. No. 785,619

Int. Cl. C07c *37/22*

U.S. Cl. 260—619 A 28 Claims


MOL FRACTION OF SOLUTE IN SOLUTION
°C
1. 1,2,4,5 TETRACHLOROBENZENE IN BENZENE
2. BISPHENOL D IN BENZENE
3. BISPHENOL A IN ETHYLENE DICHLORIDE
4. BISPHENOL A IN METHYLENE CHLORIDE
5. BISPHENOL A IN BENZENE
6. BISPHENOL A IN TOLUENE
7. BISPHENOL C IN BENZENE
8. BISPHENOL A IN TRICHLOROETHYLENE

An unexpected marked increase in the solubility of a gem-diphenylol alkane at a temperature above near the atmospheric boiling point of a solvent selected from the group consisting of benzene, toluene, methylene chloride, ethylene dichloride, and trichloroethylene, enables a process for purifying the gem-diphenylol alkane by dissolving it in the solvent at a temperature above the atmospheric boiling point and at a pressure above the vapor pressure of the resultant material, cooling the resultant material, and recovering the resulting crystals of gem-diphenylol alkane therefrom.

## 3,673,263
## DIHYDRO-β-SANTALOL AND PROCESS FOR PREPARING DIHYDRO-β-SANTALOL FROM 3-ENDO-METHYL-3-EXO(4'-METHYL-5'-HYDROXYPENTYL) NORCAMPHOR

Wayne I. Fanta, and William F. Erman, both of Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed March 29, 1968, Ser. No. 717,458

Int. Cl. C07c *35/22*; C11d *3/50*

U.S. Cl. 260—631.5 7 Claims

The novel compound, dihydro-β-santalol, and a process for preparing dihydro-β-santalol from 3-endo-methyl-3-exo(4'-methyl-5'-hydroxypentyl)norcamphor comprising the steps of (1) reacting 3-endo-methyl-3-exo(4'-methyl-5'-hydroxypentyl)norcamphor with an organometallic compound, (2) hydrolyzing the reaction product of Step 1, and (3) selectively dehydrating the hydrolyzed reaction product of Step 2 with a compound selected from the group consisting of Lewis acids, oxalic acid, p-toluenesulfonic acid, sulfuric acid, hydrochloric acid, and hydrobromic acid to obtain dihydro-β-santalol.

## 3,673,264
## METHOD OF PREPARING OPTICALLY ACTIVE PROPYLENE CHLOROHYDRINS AND PROPYLENE OXIDES

Stephen Joseph Kuhn, Sarnia, Ontario, Canada, assignor to The Dow Chemical Company, Midland, Mich.

Filed May 21, 1968, Ser. No. 730,929

Int. Cl. C07c *31/34*

U.S. Cl. 260—633 6 Claims

Optically active chlorohydrins are prepared by the action of dichloromethyl methyl ether on an optically active propylene glycol in the presence of a metal halide catalyst. Further treatment of said chlorohydrins with a strong base yields a substantially pure optically active propylene oxide. Said optically active propylene oxides have the same utilities as racemic propylene oxide which may be used as a monomer and chemical intermediate, and additionally, the polypropylene oxide produced from an optically active propylene oxide monomer is a solid, crystalline, optically active polymer. Other utilities for an optically pure sample of a chlorohydrin or propylene oxide are obvious to one skilled in the art.

## 3,673,265
## ISOPRENE RECOVERY

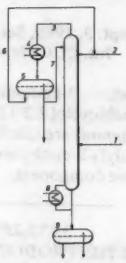
Wolfgang Swodenk, Odenthal-Globusch; Wulf Schwerdtel, Cologne; Paul Losacker, Leichlingen, and Bruno Engelhard, Cologne, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 23, 1970, Ser. No. 57,596

Claims priority, application Germany, Aug. 6, 1969, P 19 39 896.0

Int. Cl. C07r *7/08*

U.S. Cl. 260—681 6 Claims



A crude hydrocarbon mixture containing isoprene and isobutene in addition to formaldehyde monomer and polymers, such as is obtained by cracking 4,4-dimethyl-1,3-dioxane, is subjected to distillation in a column which is supplied near its head with liquid water, fouling of the column thereby being reduced and the distillate being obtained in higher purity.

## 3,673,266
## PROCESS FOR PREPARING DIHYDRO-β-SANTALOL FROM 3-ENDO-METHYL-3-EXO(4'-METHYL-5'-HYDROXYPENTYL)NORCAMPHOR

Wayne I. Fanta, Colerain Township, Hamilton County, and William F. Erman, Springfield Township, Hamilton County, both of Ohio, assignors to The Procter and Gamble Company, Cincinnati, Ohio

Filed Aug. 20, 1968, Ser. No. 753,897

Int. Cl. C07c *35/22*; C11d *3/50*

U.S. Cl. 260—631.5 12 Claims

A process for preparing dihydro-β-santalol from 3-endo-methyl-3-exo(4'-methyl-5'-hydroxpentyl)norcamphor comprising the steps of (1) reacting 3-endo-methyl-3-exo(4'-methyl-5'-hydroxypentyl)norcamphor with an organometallic

compound and, subsequently, hydrolyzing the reaction product with water to obtain a diol: (2) esterifying the primary alcohol of the diol reaction product of Step (1) to obtain a hydroxy ester; (3) dehydrating the hydroxy ester of Step (2) to obtain the ester of dihydro-β-santalol; and (4) saponifying the ester of di-hydro-β-santalol of Step (3) to obtain dihydro-β-santalol is disclosed. Dihydro-β-santalol is useful as a perfume component.

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**3,673,267**

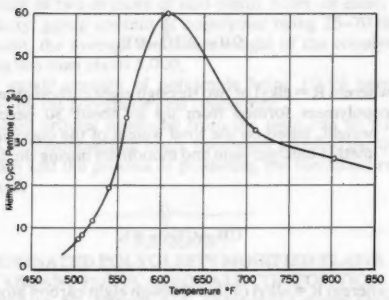
## ISOMERIZATION OF CYCLOHEXANE IN THE PRESENCE OF A MORDENITE CATALYST

**Nai Yuen Chen, Hopewell Township, Mercer County, and Fritz A. Smith, Haddonfield, both of N.J., assignors to Mobil Oil Corporation**

**Continuation-in-part of Ser. No. 765,031, Oct. 4, 1968, Pat. No. 3,551,353. This application Oct. 19, 1970, Ser. No. 81,984**

**Int. Cl. C07c *13/08***

**U.S. Cl. 260—666 P** **3 Claims**




Paraffinic hydrocarbons are isomerized under isomerizing conditions and in the presence of hydrogen with a catalyst of hydrogen mordenite having a silica to alumina mol ratio between about 20:1 and about 60:1, having associated therewith a metal selected from the group consisting of Group IB, Group VIB and Group VIII.

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**3,673,268**

## HEXACYCLOTETRACDECANES

**Paul Von R. Schleyer, Princeton, N.J., assignor to Union Carbide Corporation**

**Continuation of Ser. No. 882,787, Dec. 22, 1969, abandoned, which is a continuation of Ser. No. 809,454, Feb. 27, 1969, abandoned, which is a continuation of Ser. No. 409,545, Nov. 6, 1964, abandoned. This application Dec. 15, 1970, Ser. No. 98,438**

**Int. Cl. C07c *13/28***

**U.S. Cl. 260—666 PY** **7 Claims**

A class of hexacyclotetradecanes which are useful in the preparation of epoxy resins, paints, and varnishes, is prepared by the catalytic isomerization at temperatures of from about 25° to about 250° C. of polycyclic saturated hydrocarbons containing at least 14 carbon atoms and five fused ring systems of from three to eight carbon atoms per ring.

**3,673,269**

## CHLORINATIVE DEHYDROGENATION OF HYDROCARBONS

**Delmar Frederick Lohr, Jr., Bedford Heights; Grant Crane, and Edward L. Kay, both of Akron, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio**

**Continuation-in-part of Ser. No. 883,259, Dec. 8, 1969, abandoned. This application Sept. 16, 1970, Ser. No. 73,258**

**Int. Cl. C07c *11/02***

**U.S. Cl. 260—677 XA** **6 Claims**

Aliphatic hydrocarbons of from four to six carbon atoms are dehydrogenated by passing the hydrocarbons and chlorine through a reaction zone containing a catalyst of calcium-nickel phosphate, promoted with a minor amount of chromia, at a temperature of from 450° to 675° C.

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**3,673,270**

## HYDROGENATION OF 1,3,7-OCTATRIENE TO 1,6-OCTADIENE AND 1,5-OCTADIENE WITH CERTAIN CHROMIUM CARBONYL CATALYSTS

**Lawrence Wayne Gosser, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Filed Dec. 11, 1970, Ser. No. 97,315**

**Int. Cl. C07c *5/16*, *11/12***

**U.S. Cl. 260—680 R** **10 Claims**

1,3,7-Octatriene, which can be made by the dimerization of butadiene, can be selectively hydrogenated to 1,5-octadiene and 1,6-octadiene in the presence of a chromium carbonyl catalyst such as chromium hexacarbonyl, pentacarbonyl(phosphine) chromium and tricarbonyl(arene)chromium complexes. Isomer distribution in the product can be modified by the presence of carbon monoxide. The diene products are useful comonomers for addition copolymers such as ethylene propylene/diene elastomeric copolymers, the diene-derived units forming crosslinking sites for any of the elastomers with conventional sulfur curing systems.

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**3,673,271**

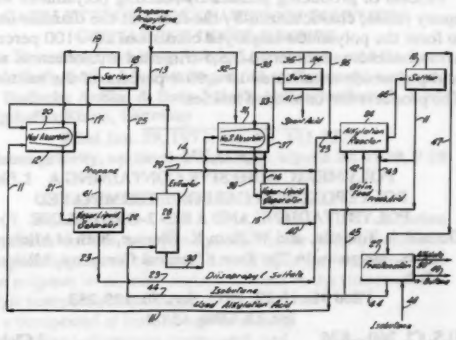
## ALKYLATION ACID RECOVERY PROCESS WITH ELIMINATION OF INERT HYDROCARBONS

**Arthur R. Goldsby, Chappaqua, N.Y., assignor to Texaco Development Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 740,916, June 28, 1968, abandoned, which is a continuation of Ser. Nos. 642,739, June 1, 1967, Pat. No. 3,564,073, and Ser. No. 692,623, Dec. 1, 1967, abandoned, and Ser. No. 704,934, April 4, 1968, abandoned. This application Dec. 30, 1970, Ser. No. 102,689**

**Int. Cl. C07c *3/54***

**U.S. Cl. 260—683.62** **6 Claims**




Process for recovering used sulfuric acid alkylation catalyst and eliminating normal paraffin hydrocarbons from olefin feed stocks for alkylation. Used sulfuric acid catalyst from an

alkylation unit is reacted in a first absorber with a first portion of olefin feed employing a stoichiometric excess of acid for substantially complete conversion of olefin to alkyl sulfate. Unreacted paraffin hydrocarbons are separated from the resulting reaction mixture and removed. The acid phase from the first absorber is extracted with isoparaffin hydrocarbon being alkylated and the raffinate acid therefrom is sent to a second absorber wherein the raffinate acid is reacted with a second portion of olefin feed employing a stoichiometric excess of olefin for substantially complete conversion of the free acid and alkyl acid sulfates to dialkyl sulfates. The dialkyl sulfates are then separated and passed to the alkylation unit. Unreacted olefinic hydrocarbons are separated from the reaction mixture and passed to either the first or second absorber.

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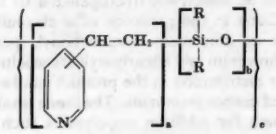
**3,673,272**

**BLOCK COPOLYMERS OF SILICONES WITH VINYL PYRIDINE**

**John W. Dean, Averill Park, N.Y., assignor to General Electric Company**

**Filed April 6, 1970, Ser. No. 26,081**
**Int. Cl. C08g *47/10*; C08f *33/08***
**U.S. Cl. 260—827** **5 Claims**

Block copolymers of silicones with vinyl pyridine having the formula:



wherein *a* is at least 25, *b* is at least 10, *c* is 1 or more, and R is selected from the class consisting of methyl and phenyl. The materials are useful for the formation of permselective membranes and allow the solubilization of silicones in a polar solvent.

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**3,673,273**

**PLASTIC OF POLYAMIDE AND EPOXY RESIN**

**Karl Schmitt, Herne; Fritz Gude, Wanne-Eickel, and Siegfried Brandt, Herne, all of Germany, assignors to Scholven-Chemie Aktiengesellschaft**

**Filed July 3, 1968, Ser. No. 742,175**
**Claims priority, application Germany, July 6, 1967, SCH 40972**
**Int. Cl. C08g *45/12***
**U.S. Cl. 260—830 P** **9 Claims**

Process of producing plastics by reacting polyamides with epoxy resins, characterized by the fact that the diamine used to form the polyamide employed consists of 20 – 100 percent of 1-amino-3-aminomethyl-3,5,5-trimethyl cyclohexane and said polyamide constitutes 10 – 99.8 percent of the mixture. The products can be shaped articles.

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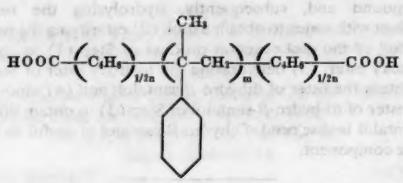
**3,673,274**

**POLYMERIC ADHESIVE CONTAINING A POLYEPOXIDE, A CARBOXY TERMINATED POLYBUTADIENE AND A BIS-2-OXAZOLINE**

**Donald A. Tomalia, and William K. Giesner, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed March 29, 1971, Ser. No. 129,253**
**Int. Cl. C08g *45/04***
**U.S. Cl. 260—836** **3 Claims**

Polymeric adhesive compositions comprising essentially stoichiometric amounts of (1) a poly 1,2-epoxyalkyl compound having an average of more than one 1,2-epoxyaliphatic group per molecule, (2) a bis-2-oxazoline or bis-2-oxazine and (3) a carboxyl terminated polybutadiene of the formula



where *n* has an average value of from 2 to about 150, *m* has a value from 3 to 6 and is principally 4.

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**3,673,275**

**ACRYLIC POLYMERS CONTAINING EPOXY RADICALS**

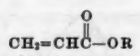
**John A. Simms, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Filed March 5, 1970, Ser. No. 16,948**
**Int. Cl. C08g *45/04***
**U.S. Cl. 260—837 R** **10 Claims**

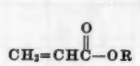
A polymer containing epoxy radicals, useful for toughening epoxy resins, produced by admixing:

A. at least one acrylic polymer selected from the group consisting of

homopolymers and copolymers of monomers having the formula



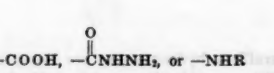
wherein R = alkyl of two through eight carbon atoms and copolymers formed from up to about 30 percent by weight, based on the total weight of the copolymer, of methyl methacrylate and monomers having the formula



wherein R = alkyl of four through eight carbon atoms;

said acrylic polymer characterized by

1. having an average of more than one radical per molecule, said radical selected from the group consisting of



wherein R = H or lower alkyl and wherein at least one of the above radicals is located on a terminal position on the acrylic polymer molecule;

2. having a number average molecular weight of above about 2,000;

3. a glass transition point below about −25° C.;

4. a solubility parameter between 8 and 10.5; and

B. at least one epoxy resin characterized by having an average of at least 1.8 epoxy radicals per molecule,

at a temperature and for a time sufficient to produce said polymer containing epoxy radicals.

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**3,673,276**

**FRICTION ELEMENTS**

**Emil C. Keller, Grosse Pointe, and Raymond E. Spokes, Ann Arbor, both of Mich., assignors to Abex Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 672,326, Oct. 2, 1967, abandoned. This application Feb. 12, 1970, Ser. No. 10,801**
**Int. Cl. C08g *51/10, 37/18, 37/20***
**U.S. Cl. 260—38** **3 Claims**

A friction element comprising fillers in an organic binder is

prepared from a binder comprising a thermosetting phenol-formaldehyde resin, a polymer of cashew nut shell liquid, and a Buna-N rubber. The rubber is to have an acrylonitrile content exceeding a specified limit measured in terms of nitrogen content, namely, upward of 9.8 percent nitrogen.

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**3,673,277**

## THERMOSETTING RESIN OF POLYAMIDE AND COPOLYMER OF POLYCARBOXYLIC ACID AND AN OLEFIN

**Karl Schmitt, Herne; Fritz Guda, Wanne-Eickel, and Siegfried Brandt, Herne, all of Germany, assignors to Scholven-Chemie Aktiengesellschaft, Gelsenkirchen-Buer, Germany**

**Filed June 3, 1969, Ser. No. 830,115**

**Claims priority, application Germany, June 5, 1968, P 17 69 515.7**

**Int. Cl. C08g *41/04***

**U.S. Cl. 260—857 UN** **21 Claims**

Thermosetting resin composition comprising:

a. as a first component, polyamide which is substantially non-crystalline and has an average molecular weight of less than 5,000,

b. as a second component, a copolymer of ethylenically unsaturated dicarboxylic acid, anhydride, partial ester, or partial amide thereof, mixture of two or more of the free acid, anhydride, partial ester and partial amide, and an olefin or ethylenically unsaturated ether or ester, or a mixture of two or more of said olefin, ether, or ester, the carboxyl group content of copolymer being 25–70 mole percent, the average molecular weight of the copolymer being less than about 5,000,

c. the weight percent of polyamide being 10–99 percent based on the polyamide plus copolymer.

Thermoset articles produced from the resin can be transparent. The thermosetting resin, thermoset articles, the thermoset resin and the process of producing the thermoset resin are claimed.

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**3,673,278**

## FLUORINATED POLYOLEFIN MODIFIED FLAME RETARDANT POLYCARBONATE COMPOSITION

**Charles Bialous, Mt. Vernon, Ind., assignor to General Electric Company**

**Filed Jan. 4, 1971, Ser. No. 103,823**

**Int. Cl. C08g *39/10***

**U.S. Cl. 260—873** **9 Claims**

A polycarbonate composition consisting of a polycarbonate and a fluorinated polyolefin. The polycarbonate may be either a homopolymer of a halogen-substituted dihydric phenol or a copolymer of an unsubstituted dihydric phenol and a halogen-substituted dihydric phenol or a mixture of the above homopolymer and copolymer, or a mixture of the homopolymer and copolymer with a homopolymer of an unsubstituted dihydric phenol. The fluorinated polyolefin is present in an amount of 0.1–3.0 weight percent and is of the type which does not form fibrils when subjected to a mechanical shearing action.

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**3,673,279**

## THERMOPLASTIC RESIN HAVING HIGH IMPACT STRENGTH

**Akira Takahashi; Hiroo Kojima; Masao Ogawa, all of Tokyo; Hiroshi Osuka, Kanagawa-ken, and Shoichi Kobayashi, Tokyo, all of Japan, assignors to Showa Denka Kabushiki Kaisha, Tokyo, Japan**

**Continuation-in-part of Ser. No. 339,899, Jan. 24, 1964. This application Nov. 22, 1968, Ser. No. 784,517**

**Int. Cl. C08f *29/24, 19/04***

**U.S. Cl. 260—876 R** **2 Claims**

A thermoplastic resin having high impact strength and a process for producing such thermoplastic resin, the thermoplastic resin being obtained by polymerizing a homogeneous mixture comprising, (a) chlorinated polyethylene; (b) acrilonitrile; and (c) styrene. Also, a thermoplastic resin composition having a high impact strength comprising the thermoplastic resin set forth above in admixture with a polyvinyl chloride resin and optionally a minor amount of polymethylmethacrylate.

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**3,673,280**

## ELASTOMERIC MATERIALS AND PROCESS THEREFOR

**Robert G. Minton, Levittown, and Sidney Melamed, Elkins Park, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.**

**Continuation-in-part of Ser. No. 372,476, June 4, 1964, abandoned. This application June 14, 1967, Ser. No. 655,707**

**Int. Cl. C08f *15/00***

**U.S. Cl. 260—878 R** **23 Claims**

Elastomeric materials and methods of producing them comprising:

A. About 50–90 percent by weight of a base elastomeric composition as a "backbone" or main component formed by copolymerizing a mixture comprising

1. about 75–99.9 percent by weight of the base composition of at least one monomer polymerizable to give a rubbery polymer and selected from the group consisting of alkyl ($C_2$–$C_8$)acrylates, and mixtures thereof with each other and with up to an equal weight amount of ethylene, propylene, or isobutylene; and
2. at least about 0.1 percent by weight of the base composition of at least one ethylenically unsaturated monomer copolymerizable with (A)(1) and containing at least one radical effective to crosslink said base composition by a reaction which is activated separately from the polymerization reaction; and

B. About 50–10 percent by weight of a reinforcing material for the base composition and dispersed throughout the base composition consisting of a polymer of

1. at least one halogen monomer selected from the group consisting of vinylidene chloride, vinylidene fluoride, vinylidene fluorochloride, vinyl chloride and vinyl fluoride; and
2. up to about 6 percent by weight of the mixture of at least one $\alpha,\beta$-monoethylenically unsaturated monomer copolymerizable with (B)(1).

The backbone is crosslinked by virtue of the reaction of the radicals in monomer (A)(2) to make the backbone solvent insoluble. The backbone may optionally contain a diluent and/or a hardener, the latter being a monomer effective to raise the glass transition temperature of the copolymer. Preferably, the elastomers are spun into fibers or extruded into films.

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**3,673,281**

## CATALYTIC HYDROGENATION OF POLYMERS CONTAINING DOUBLE BONDS

**Klaus Bronstert, Carlsberg; Volker Ladenberger, and Gerhard Fahrbach, both of Schwetzingen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany**

**Filed Jan. 29, 1971, Ser. No. 111,137**

**Claims priority, application Germany, March 20, 1970, P 19 13 263.2**

**Int. Cl. C08d *5/00, 5/02*; C08f *27/24***

**U.S. Cl. 260—880 B** **2 Claims**

A process for the catalytic hydrogenation of polymers containing double bonds by the action of hydrogen on a solution of the polymer in an inert organic solvent in the presence of a catalyst complex comprising:

A. a compound of iron, cobalt or nickel,

B. an organo-aluminum compound, and

C. a hexa-alkylphosphoric acid triamide of the general formula $OP(NR_2)_3$

in which R stands for alkyl of from one to four carbon atoms, the catalyst components A and B being used in a molar ratio of

from 1 : 40 to 1 : 1 and the components A and C in a molar ratio of from 1 : 0.5 to 1 : 100.

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3,673,282

## CORE-SHELL VINYL HALIDE POLYMERS HAVING A LONG-CHAIN VINYL ETHER CONTAINING SHELL

Massimo Baer, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 669,386, Sept. 21, 1967, abandoned. This application May 15, 1970, Ser. No. 37,880

Int. Cl. C08f *15/06, 15/26*

U.S. Cl. 260—884 6 Claims

There is disclosed a process for the preparation of copolymers of a vinyl halide and a long-chain aliphatic vinyl monomer. In accordance with the process, an aqueous dispersion is formed of a preformed vinyl halide polymer, a vinyl halide monomer and a long-chain aliphatic ether monomer capable of copolymerizing with the vinyl halide monomer. Copolymerization of said monomers in the presence of the aqueous dispersion of the preformed polymer leads to a polymeric particle whose shell contains a major proportion of the polymeric long-chain aliphatic ether monomer and whose core is essentially devoid of this monomer. This preferential concentration of a lubricating monomer on the outer shell of the particle leads to greatly improved flow with only a minor loss in glass temperature.

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3,673,283

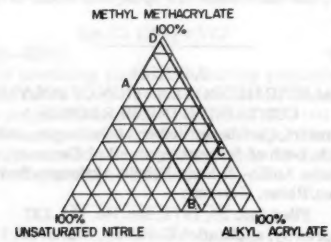
## VINYL CHLORIDE POLYMER BLENDED WITH A NITRILE-METHACRYLATE-ACRYLATE TERPOLYMER

Akira Tanaka, Yokohama; Tsuyoshi Hattori, Tokyo; Hirotomo Anno, and Testuyo Kawahara, both of Kamakura, all of Japan, assignors to The Japanese Geon Company, Ltd., Tokyo, Japan

Filed March 23, 1970, Ser. No. 21,927

Int. Cl. C08f *37/18*

U.S. Cl. 260—898 4 Claims




A vinyl chloride polymer composition excelling in processability, transparency and other properties, such composition comprising (I) at least one vinyl chloride polymer selected from the group consisting of vinyl chloride homopolymers and vinyl chloride copolymers, vinyl chloride content of which is at least 70 percent by weight and (II) a copolymer consisting of 2 – 30 percent by weight of an unsaturated nitrile, 10 – 98 percent by weight of methyl methacrylate and 0 – 60 percent by weight of an alkyl acrylate.

3,673,284

## 2-HYDROCARBYL AMINOVINYL PHOSPHONATES OR PHOSPHINATES

Wataru Nagata, Nishinomiya-shi, and Yoshio Hayase, Sakai-shi, Osaka, both of Japan, assignors to Shionogi & Co., Ltd., Higashi-ku, Osaka, Japan

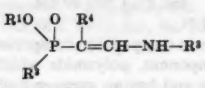
Filed Feb. 27, 1969, Ser. No. 803,106

Claims priority, application Japan, March 7, 1968, 43/14901; March 19, 1968, 43/18134; March 19, 1968, 43/18135; March 30, 1968, 43/20805

Int. Cl. C07f *9/38*; C07c *45/00*

U.S. Cl. 260—944 15 Claims

Reagents particularly useful for the preparation of $\alpha\beta$-unsaturated aldehydes are provided herein, which reagents consist of compounds of the general formula:



wherein $R^1$ is a lower alkyl group, $R^2$ is a member selected from the group consisting of $R^1O$, a lower alkyl group, an aralkyl group of seven to eight carbon atoms and an aryl group of six to seven carbon atoms, $R^3$ is a member selected from the group consisting of an acyclic or cyclic alkyl group of one to six carbon atoms and an aryl group of six to seven carbon atoms, and $R^4$ is a member selected from the group consisting of a hydrogen atom, a lower alkyl group, an aralkyl group of seven to eight carbon atoms, and a halogen atom. These compounds react with carbonyl compounds to form unsaturated aldehydes and are especially useful in the synthesis of various pharmaceutical compounds such as various steroids, vitamin A, vitamin D, etc.

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3,673,285

## PREPARATION OF VINYL ORGANO-PHOSPHOROUS COMPOUNDS

Kingso Chingtsung Lin, Newark, Ohio, assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed Nov. 12, 1969, Ser. No. 876,139

Int. Cl. C07f *9/28*

U.S. Cl. 260—970 8 Claims

Compounds containing a P—H bond add to hydrocarbon acetylenic unsaturation in the presence of metal coordinating catalysts selected from Groups VIA and VIII of the Periodic Table, to produce unsaturated organophosphorus compounds in good yields. The unsaturated organophosphorus compounds find utility as intermediates for polymerization reactions in the production of flame resistant polymers.

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3,673,286

## METHOD OF MAKING PROPELLANT BODY HAVING VOIDS THROUGHOUT BODY

Robert F. Remaly, Olympia Fields, and William A. Abel, Joliet, both of Ill., assignors to Victor Comptometer Corporation, Chicago, Ill.

Filed Jan. 19, 1970, Ser. No. 4,052

Int. Cl. C06b *21/02*

U.S. Cl. 264—3 R 22 Claims

A propellant for caseless ammunition for firearms and processes of manufacture thereof comprising at least partial dissolving of commercial nitrocellulose, wetted with a predetermined amount of a volatile wetting agent such as ethyl alcohol, by a solvent, such as acetone, to form a wet doughy mass of propellant, uniformly mixing a predetermined amount and size of removable filler particles, such as 30 percent coarse and 70 percent fine potassium nitrate particles in the wet doughy mass of propellant, forming a propellant body, and removing the wetting agent, solvent, and potassium nitrate particles to form voids throughout the propellant body.

3,673,287

## METHOD OF MAKING CAST-IN -PLACE END-BURNING PROPELLANT GRAINS

Charles E. Thies, Huntsville; Bernard L. Thompson, Toney, and Stanley E. Anderson, Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army

Filed Dec. 23, 1968, Ser. No. 786,488
Int. Cl. C06b 21/02
U.S. Cl. 264—3 9 Claims

An improved method of making cast-in-place end-burning propellant grains for rocket motors comprising the steps of applying a release agent to the rocket motor case insulation or rocket motor case, applying a liner/restrictor material over the release agent, casting the propellant directly inside the restrictor, curing the propellant and restrictor material to thereby bond the propellant directly to the restrictor whereby an end-burning propellant grain is formed in the restrictor adjacent the release agent which is adjacent the rocket motor case insulation or the rocket motor case of he rocket motor containing the cast-in-place end-burning propellant grain.

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3,673,288

## MICROWAVE METHOD FOR TEMPERING TAR-BONDED REFRACTORY BRICKS

Edwin E. Childs, Jr., York, Pa., assignor to Dolomite Brick Corporation of America, York, Pa.

Continuation-in-part of Ser. No. 790,166, Jan. 9, 1969, abandoned. This application Sept. 17, 1970, Ser. No. 73,636
Int. Cl. H05b 9/00; C04b 33/32, 35/02
U.S. Cl. 264—25 12 Claims

Tar-bonded basic refractory articles such as tar-bonded bricks and the like, are heated to tempering temperatures by the application of microwave energy. Tempering may be completely or partially carried out by the microwave heating operation.

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3,673,289

## QUENCHING INJECTION MOLDED POLYCARBONATE PARTS FOR FATIGUE RESISTANCE

John Gagliani, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1970, Ser. No. 6,977
Int. Cl. B29c 25/00
U.S. Cl. 264—28 3 Claims

A process for the production of void free enhanced impact fatigue strength polycarbonate parts wherein parts are molded in a heated die and immediately after the molding cycle quenched in a liquid bath such as ice water.

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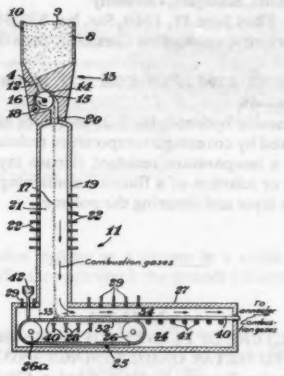
3,673,290

## FOAMED CLAY PROCESS

Burton D. Brubaker, and Nathan Waldman, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 26, 1969, Ser. No. 880,013
Int. Cl. C04b 21/00; B28b 1/50
U.S. Cl. 264—43 9 Claims

Disclosed is a foamed ceramic material having a relatively small and uniform cell structure. The material is suitable for structural or insulating purposes. A continuous process for producing the foamed ceramic material comprises dropping a bloatable ceramic composition, in particulate form, through a heated zone thereby fusing and bloating the particles, and subsequently collecting the fused particles. To produce the desired cellular structure, the process does not fully bloat the particles during dropping, thereby delaying part of the bloating of the particles until after they have been collected as an agglomerated slab.

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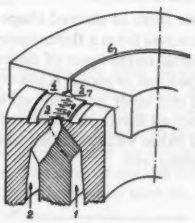
3,673,291

## METHOD FOR THE PRODUCTION OF SYNTHETIC SHEET MATERIALS

Ole-Bendt Rasmussen, Topstykket 7, Birkerod, Denmark

Filed Dec. 27, 1968, Ser. No. 787,388
Claims priority, application South Africa, Dec. 28, 1967, 67/7792; Great Britain, Dec. 29, 1967, 59,204/67; Denmark, Feb. 27, 1968, 766/68; June 25, 1968, 3028/68; Sept. 11, 1968, 4357/68
Int. Cl. B29d 7/16, 27/00; B29f 3/10
U.S. Cl. 264—46 16 Claims



Method for the production of sheet materials comprising the steps of preparing a fluid lamellar sheet product in which the lamellae are laying in flat sandwich-like arrangement at the surfaces and are perpendicular to the sheet plane in the core zone, setting said sheet product, disrupting the connections between the lamellae in the core zone and separating the sheet product thus formed into two parts in a plane substantially parallel to the sheet plane. In a specific embodiment the fluid sheet product comprises two sets of lamellae, each set forming one surface layer, the lamellae of said two sets being in intermeshing arrangement within the core zone.

3,673,292

## PROCESS FOR THE PREPARATION OF GAS PERMEABLE HYDROPHOBIC FOILS FOR ELECTROCHEMICAL CELLS

Klaus Kock, Tubingen-Lustnau, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed June 11, 1969, Ser. No. 832,501

Claims priority, application Germany, June 12, 1968, P 17 69 595.3

Int. Cl. B29d *27/08*; C08f *3/22*; H01m *3/02*

U.S. Cl. 264—49 8 Claims

Gas permeable hydrophobic foils useful for electrochemical cells prepared by covering a temperature resistant hot plate or mold with a temperature resistant release layer, spraying a suspension or solution of a fluorine containing polymer onto said release layer and sintering the polymer.

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3,673,293

## MANUFACTURE OF PLASTER OF PARIS MOLD HAVING SPRAYED METAL OXIDE LININGS AND PRODUCT

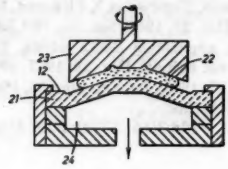
Ernest Douglas Teague, Welwyn Garden City, England, assignor to Norton Abrasives Limited, Welwyn Garden City, England

Continuation-in-part of Ser. No. 633,129, April 24, 1967, abandoned. This application Feb. 17, 1970, Ser. No. 12,120

Claims priority, application Great Britain, April 29, 1966, 18,986/66

Int. Cl. C04b *39/08*; B32b *13/04*; B28b *7/36*

U.S. Cl. 264—60 9 Claims




A metal or ceramic form of desired shape and conditioned to permit its later removal from a flame sprayed layer is flame sprayed to form a metal oxide layer of desired thickness having a porosity of 10 percent or more. A plaster of paris slurry is then poured around this layer and allowed to set up at which time the form is removed leaving a plaster of parismold with a flame sprayed metal oxide wear resistant working lining suitable for use in slip casting, etc.

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3,673,294

## METHOD FOR THE MANUFACTURE OF MARBLEIZED SOAP BARS

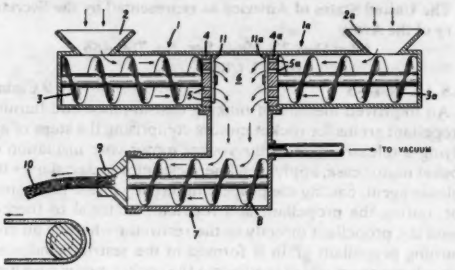
Raymond George Matthael, Fair Lawn, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Oct. 2, 1969, Ser. No. 863,253

Int. Cl. B29f *3/12*

U.S. Cl. 264—75 5 Claims

The manufacture of marbleized toilet bars is accomplished by preparing two or more differently colored batches of soap or detergent particles, the soap or detergent compositions used all having approximately the same viscosity and plasticity. The particles range from three-sixteenths to three inches in diameter and from three-sixteenths to seven inches long. Approprirate proportions of pellets are subsequently charged into a vacuum chamber and extruded in the form of a continuous log which is cut and stamped into individual soap bars.

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3,673,295

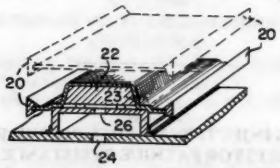
## PROCESS FOR SHAPING TEXTILE ARTICLES USING FLUID THERMOFORMING TECHNIQUES

Robert Charles Winchklhofer; Gene Clyde Weedon, both of Richmond, Va., and George Howard Collingwood, West Warwick, R.I., assignors to Allied Chemical Corporation, Broadway, N.Y.

Continuation-in-part of Ser. No. 761,447, Sept. 23, 1968, abandoned. This application Oct. 30, 1970, Ser. No. 85,692

Int. Cl. B29c *17/04*, *23/00*; D02g *3/04*

U.S. Cl. 264—89 6 Claims




Articles are manufactured from textile material composed of filaments prepared from blended fiber-forming polymers having different chemical properties, at least one of the fiber-forming polymers being dispersed as fibrils in a lower melting point polymeric matrix. The article is produced by heating the material to a temperature above the melting point of the matrix-forming polymer but below the melting point of the dispersed fibrils to shrink said article thereby decreasing the porosity thereof and afterwards forming the heated material into a three-dimensional shape using vacuum or other fluid pressure.

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3,673,296

## METHOD FOR ELECTROSTATICALLY HOLDING PARTICLES ALONG A MOLD SURFACE

Charles A. Timko, Westmont, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

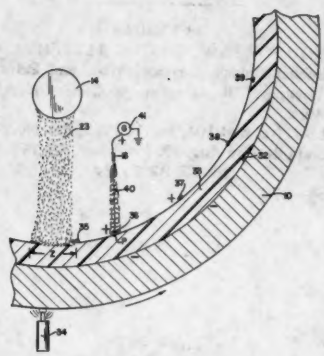
Filed May 9, 1969, Ser. No. 826,781

Int. Cl. B29f *5/02*

U.S. Cl. 264—24 5 Claims

Particles of plastic material are attracted to a mold surface by impressing an electrostatic charge on the particles subsequent to their deposit, minimizing disturbance of the deposi-

tion stream and sticking of powder in the deposition apparatus. A roll deposition unit and corona bar are employed in association with a rotating mold to form a cylindrical member from powdered plastic material. The unit deposits powder in a strip zone lengthwise of the mold. The corona bar is positioned externally of the roll case, parallel to and coextensive with the roll and closest to the cylindrical mold wall in a plane outside the stream of powder flowing from the roll to the mold wall. When the bar is charged and the mold is grounded, the resultant discharge is largely concentrated outside the stream, minimizing electrostatic effect on particles in the stream.



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**3,673,297**

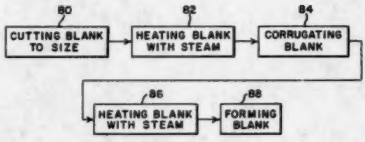
**METHODS OF MANUFACTURING ELECTRICAL INSULATING STRUCTURES**

**Harold R. Moore, R. R. 6 Forest Hills, Muncie, Ind., and Heinz G. Fischer, 12505 W. Centalane, Elm Grove, Wis.**

**Continuation of Ser. No. 744,210, July 11, 1968, abandoned. This application Oct. 8, 1970, Ser. No. 79,284**

**Int. Cl. B29b 3/00; B29j 5/06**

**U.S. Cl. 264—138** **2 Claims**




Methods of manufacturing insulating structures for electrical inductive apparatus, such as angular, channel-shaped structures for coil edge insulation. The methods include the step of subjecting the insulator blank to steam for a predetermined period of time, which step is promptly followed by forming the blank into the desired configuration in a heated press.

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**3,673,298**

**METHOD FOR COOLING PELLETS SEVERED FROM EXTRUDED PLASTIC STRANDS**

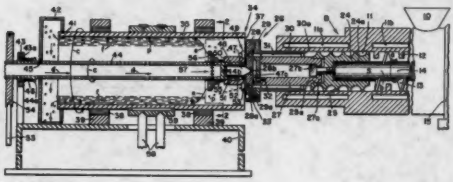
**Richard W. Miler, Saginaw, Mich., assignor to Baker Perkins Inc., Saginaw, Mich.**

**Division of Ser. No. 743,783, July 10, 1968, Pat. No. 3,608,142. This application June 11, 1970, Ser. No. 57,874**

**Int. Cl. B01j 2/20**

**U.S. Cl. 264—142** **6 Claims**

A method of cooling pellets severed from extruded plastic strands, the cooling being effected by collecting the pellets in a rotating housing to which cooling liquid is supplied in a manner to form a centrifugally maintained pellet collecting, coolant annulus moving as a stream in a spiral path axially away from a die through which the strands are extruded.



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**3,673,299**

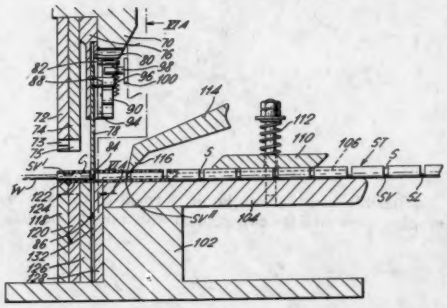
**METHOD OF APPLYING SLEEVES TO ELECTRICAL CONNECTORS**

**Ray Mervyn Robins, Auburn, New South Wales, Australia, assignor to AMP Incorporated, Harrisburg, Pa.**

**Division of Ser. No. 680,687, Nov. 6, 1967, Pat. No. 3,506,411. This application Feb. 27, 1970, Ser. No. 15,017**

**Int. Cl. B29d 7/16**

**U.S. Cl. 264—159** **1 Claim**



Electrical connectors are post insulated by cold-forming thereon dielectric sleeves which are connected together in end-to-end strip form as a series of sleeves and this strip of sleeves is fed to a crimping station so that the leading sleeve of the strip is cold-formed over an electrical connector at the crimping station. The strip of sleeves may be made by cutting transverse slots in a plastic tube such as, for example, a tube of polyvinyl chloride.

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**3,673,300**

**METHOD FOR ROUNDING WELDED EDGE SEAMS**

**Anton Muhlbach, Frankfurt/Main-Sossenheim, and Gerhard Lauckhardt, Frankfurt Main-Rodelheim, both of Germany, assignors to USM Corporation, Boston, Mass.**

**Filed June 23, 1970, Ser. No. 49,111**

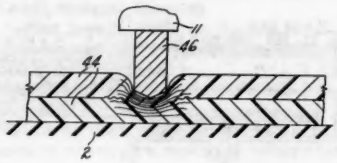
**Claims priority, application Germany, June 23, 1969, P 19 31 827.5**

**Int. Cl. B29c 17/14, 27/02**

**U.S. Cl. 264—160** **2 Claims**

A method and apparatus for producing rounded edges on cuts made through welded seams in layers of material by a die placed on the material in which the die is first pressed into but

not through the seams while the weld is soft to roundingly deform the material adjacent the die. After solidification of




the weld, further die pressure cuts the material to form a welded edge seam having rounded edges.

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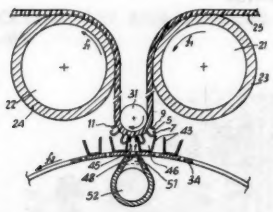
3,673,301

## FLEXIBLE BANDS FITTED WITH HOOKS FOR THE FABRICATION OF SEPARABLE FASTENING DEVICES

Patrick Billarant, 20, Avenue des Folies Chaillou, Nantes, Loire-Atlantique, France

Filed Dec. 2, 1969, Ser. No. 881,533
Claims priority, application France, Dec. 3, 1968, 68176343
Int. Cl. B29c 17/14, 23/00
U.S. Cl. 264—163 3 Claims




A flexible band having hooks formed of threads of thermoplastic material for engagement with a similar flexible band having elements adapted to cooperate with said hooks so as to constitute a separable fastening device, in which the hooks are obtained by cutting one of the two loop arms of thermoplastic threads, the cutting operation being carried out at a predetermined distance from the crest of each loop. A terminal enlargement is essentially formed on at least one of the two thread extremities which result from the cutting operation.

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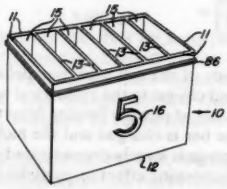
3,673,302

## METHOD FOR FABRICATING BATTERY CASES

Vincent Michael Halsall, Bayside, Wis., and Peter Anthony Cosme, Lockport, Ill., assignors to Globe-Union Inc., Milwaukee, Wis.

Division of Ser. No. 608,104, Jan. 9, 1967, Pat. No. 3,509,603.
This application Aug. 19, 1968, Ser. No. 798,205
Int. Cl. B29f 1/14
U.S. Cl. 264—328 2 Claims



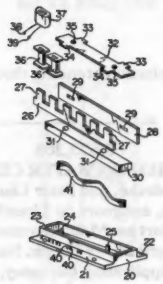

A molding method for injection molding long thin walls of uniform thickness such as the walls of a battery case. The uniform thickness walls are molded between cores. The pressure at the walls is relieved, preferably by withdrawing some of the cores, before the molded part is entirely separated from the mold. Dimensional stability is improved by rigidly supporting the mold cores during the initial stage of plastic injection.

# ELECTRICAL

## 3,673,303
## VOLTAGE GENERATING DEVICE FOR CONTROLLING MUSICAL TONE OUTPUT FROM ELECTRONIC MUSICAL INSTRUMENTS

Hiroshi Amano, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Sept. 1, 1970, Ser. No. 68,748
Claims priority, application Japan, Sept. 3, 1969, 44/83514
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 12 Claims



There is disclosed a voltage generating device of compact structure for controlling musical tone output signals from an electronic keyboard musical instrument to a level corresponding to the magnitude of a key depressing force or the velocity with which the key is depressed. Below the keyboard is positioned a non-magnetic case which supports two parallel magnetic cores and a magnet disposed therebetween which are common to a plurality of keys, and on at least one of the two magnetic cores there are fitted a plurality of coils in a manner that the coils correspond to the respective keys. There is mounted on the underside of each key a magnetic material constituting a magnetic circuit along with the two magnetic cores and the magnet received in the case. On depressing a key, the magnetic material mounted on the key is drawn near the two magnetic cores to generate in the coil a voltage having a level corresponding to the velocity with which the key is depressed, the voltage being used in controlling the corresponding musical tone output signal.

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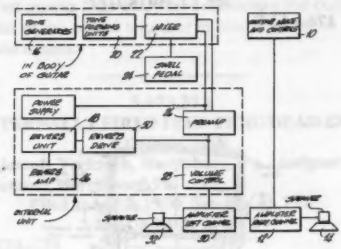
## 3,673,304
## ELECTRONIC GUITAR HAVING PLURAL OUTPUT CHANNELS, ONE OF WHICH SIMULATES AN ORGAN

Attila Dudas, New York, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Nov. 13, 1970, Ser. No. 89,236
Int. Cl. G10h *3/00, 5/00*
U.S. Cl. 84—1.01 4 Claims

An electric guitar is coupled through one channel of a stereo amplifier to a corresponding speaker in conventional manner while separate means responsive to string movements



and pedal controls produce an organ like sound amplified in the other channel and reproduced in another speaker.

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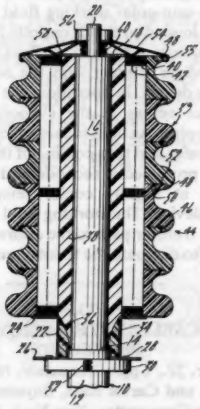
## 3,673,305
## CAPACITIVELY GRADED MODULAR POTHEAD FOR H-V CABLE

Matthew S. Mashikian, Huntington Woods; James K. Kelley, Carleton, and William C. McMurray, St. Clair Shore, all of Mich., assignors to The Detroit Edison Company, Detroit, Mich.

Filed Nov. 4, 1970, Ser. No. 86,709
Int. Cl. H02g *15/02, 15/22*
U.S. Cl. 174—12 BH 24 Claims



Improved electrical insulating devices, preferably modular, including series connected capacitances provided by flat contacting alternated insulating and conducting elements. The insulating material between conducting elements is a resin including ceramic filler providing desirable variations in dielectric constant. The end capacitance forming elements of each module are of metal and are provided with fastening means for interconnecting the modules.

**3,673,306**

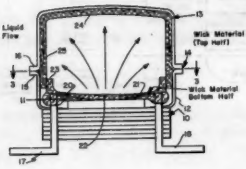
## FLUID HEAT TRANSFER METHOD AND APPARATUS FOR SEMI-CONDUCTING DEVICES

**Milton E. Kirkpatrick, Palos Verdes Peninsula, Calif., assignor to TRW Inc., Redondo Beach, Calif.**

**Continuation of Ser. No. 764,468, Oct. 2, 1968. This application Nov. 2, 1970, Ser. No. 89,091**

**Int. Cl. H01k** *1/12*

**U.S. Cl. 174—15 R** **7 Claims**




There is disclosed the use of a heat pipe type thermal conductive path within a metallic housing such as a transistor can for a highly efficient cooling of high power semi-conductor devices which normally require large heat dissipation. An electrically non-conductive wick structure is provided which is formed, for example, from high purity silica glass cloth in a shape resembling a hollow "marshmallow" and which forms a liner for the entire transistor can. The wick contacts both the active surface of the semi-conductor device in the bottom of the can and the upper walls of the can. Prior to placing the can upo n its mounting base, an appropriate amount of electrically non-conductive, non-polar working fluid such as high purity organic liquid is loaded so that it entirely fills or saturates only the wick like structure. The working fluid held within the wick is thus in immediate contact with the active surface of the semi-conducting device. In operation, the surface of the semi-conductor device serves as the evaporator section of the closed loop heat pipe. As fluid is caused to evaporate from this region, heat transfer and thus cooling of the device is effected. The vapor thus produced is recondensed over regions of the can which are at slightly cooler temperatures than the semiconductor device. The working fluid vapor thus provides an efficient heat transfer path to the entire radiating surface of the can in order to dissipate the thermal energy of concern.

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**3,673,307**

## PIPE TYPE CABLES WITH IMPROVED SKID WIRE PROTECTION

**George S. Eager, Jr., Upper Montclair, N.J.; David A. Silver, Roslyn, N.Y., and Carlos Katz, Bayonne, N.J., assignors to General Cable Corporation, New York, N.Y.**

**Filed April 21, 1971, Ser. No. 135,928**

**Int. Cl. H01b** *9/06*

**U.S. Cl. 174—25 R** **15 Claims**

This specification discloses an electric cable with a skid wire that has a lower co-efficient of friction than metal skid wires and is made of synthetic material having electric resistance that is too high for the skid wire to maintain electric continuity between an electrostatic shield of the cable and a metal surface in a pipe or other conduit in which the cable is installed. Metal or other good electrical conducting means extends through the skid wire with exposed surfaces of the metal in position to maintain the desired electrical continuity between the electrostatic shield and the conduit. The skid wire has a perforated metal center strip with plastic extruded along both sides of the strip and locked together in a one piece extrusion

by portions of the plastic extending through the perforations in the strip.

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**3,673,308**

## SILICON WAFER CELL

**Heinz Juchmann, Belecke, and Peter Lauterbach, Kallenkardt, both of Germany, assignors to Licentia Patent-Verwaltings G.m.b.H., Frankfurt am Main, Germany**

**Filed April 28, 1971, Ser. No. 138,030**

**Claims priority, application Germany, April 30, 1970, P 20 21 158.9**

**Int. Cl. H02g** *5/00*

**U.S. Cl. 174—52 S** **2 Claims**

In a ceramic housing, a silicon wafer is held centered with respect to the housing by a flat tensioning ring having three protrusions on its inner periphery and three protrusions on its outer periphery, the three protrusions on the outer periphery being in contact with the inner wall of the housing, the three protrusions on the inner periphery being in contact with the outer edge surface of a carrier disc on which the wafer is securely mounted.

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**3,673,309**

## INTEGRATED SEMICONDUCTOR CIRCUIT PACKAGE AND METHOD

**Claudio Dalmasso, Turin, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Turin, Italy**

**Filed Nov. 3, 1969, Ser. No. 873,499**

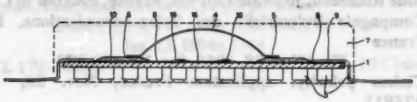
**Claims priority, application Italy, Nov. 6, 1968, 53759 A/68**

**Int. Cl. H05k** *5/02*

**U.S. Cl. 174—52 PE** **20 Claims**

An integrated circuit package features a hermetically sealed cap bonded to a substrate by a printed glass frame. Printed circuit metallization extends under the cap and frame from the central area of the substrate surface to the edge of the surface. Connecting lugs are bonded to this metallization at the extremities of the substrate surface. At the central area of the substrate surface, the means for connecting the inner portion

of the metallization to the integrated circuit terminals traverses and insulated support member. The printed metallization



paths can cross each other and are insulated by printed insulation at the crossing points.

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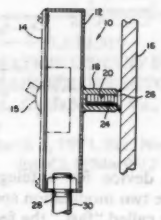
**3,673,310**

**ELECTRICAL UTILITY BOX**

**Robert Louis Welsh, Cherry Hill, N.J., assignor to Omark Industries, Inc., Portland, Oreg.**

**Filed Dec. 4, 1969, Ser. No. 882,046**
**Int. Cl. H02g *3/08***
**U.S. Cl. 174—58** **1 Claim**



A metallic utility box adapted to be secured to metallic walls. A first end weldable stud is welded to the back of the box and a second end weldable stud is welded by the stud welding technique to the metallic wall at the desired location of the box. Mating thread means on the projecting ends of the first and second studs permit the utility box to be secured in place by threading the studs together. Electrical conduit is secured to the box to prevent the box from rotating and consequently becoming unsecured from the wall.

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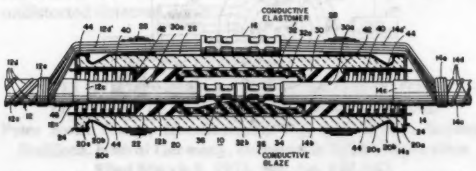
**3,673,311**

**CORONA FREE COUPLING ASSEMBLY FOR COAXIAL CABLES**

**Donald O. Misare, Riverside, Ill., assignor to Joslyn Mfg. and Supply Co., Chicago, Ill.**

**Filed Oct. 22, 1969, Ser. No. 868,547**
**Int. Cl. H02g *15/08***
**U.S. Cl. 174—73 R** **5 Claims**




A corona free coupling assembly for connecting high voltage coaxial cables comprising a body of elastomeric insulating material having an elongated bore open at opposite ends for receiving end portions of said cable. A tubular inner shield means is embedded in said body in coaxial alignment in said bore and spaced from opposite ends thereof; a tubular connector sleeve is insertable into the bore of the filler body within the inner shield means for connecting the conductors of said cables in end-to-end relation; integrally formed contact means projecting inwardly of the bore of said inner shield means is provided for making electrical contact between the inner shield means and said connector sleeve when the latter is inserted within the former; conductive outer shield means is provided on the outer surface of an insulating housing receiving the elastomeric filler body for connecting the outer shielding systems of the cables together in coaxial relation with said inner shield means.

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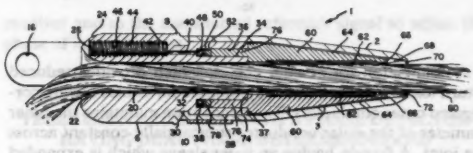
**3,673,312**

**INTERNALLY FIRED FEED THRU DEAD END CONNECTOR**

**William Joseph Vockroth, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed June 12, 1970, Ser. No. 45,732**
**Int. Cl. H02g *15/08***
**U.S. Cl. 174—79** **3 Claims**



This invention relates to a dead end connector and more particularly to a connector having a housing thru which extends a continuous bore adapted to receive a transmission cable, a chamber containing an explosive charge and a plurality of gripping jaws in circular relation to the bore and operable to be forcibly driven by the explosive charge into a gripping engagement with the transmission cable.

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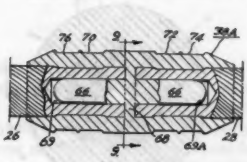
**3,673,313**

**ELECTRICAL JUNCTION FOR HIGH-CURRENT CONDUCTORS AND CONNECTOR AND METHOD SUITABLE FOR MAKING SAME**

**Wiley J. Pickett, Moorestown, N.J., and Bynum E. Smith, Richmond, Va., assignors to Utility Industries Inc., Westmont, N.J., by said Bynum E. Smith**

**Filed April 23, 1970, Ser. No. 31,226**
**Int. Cl. H02g *15/08***
**U.S. Cl. 174—90** **2 Claims**



In a junction of the type in which two high-current conductors are bridged by an external sleeve crimped to the exterior of both conductors, additional axially-overlapping connecting elements are employed to provide connection between interior portions of said conductors, the axially-overlapping portions of said connecting elements being held in stable intimate contact with each other by crimping applied to the exterior of said sleeve member. A preferred connector for use in making such a junction comprises a conductive sleeve for receiving the high-current conductors at its opposite ends and a pair of conductive prongs supported axially therein by a conductive support secured conductively to the interior of said sleeve,

said prongs being oppositely directed to fit within corresponding recesses in said high-current conductors, whereby the prongs provide stable electrical connection to said high-current conductors after the exterior sleeve has been crimped.

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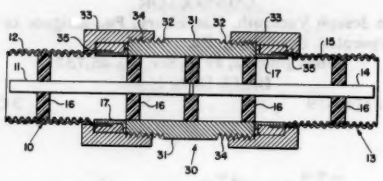
## 3,673,314
## CABLE CONNECTORS

Detlef Zimmermann; David Campbell, and George De Bortoli, all of Ottawa, Ontario, Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Feb. 22, 1971, Ser. No. 117,524
Int. Cl. H02g 15/08
U.S. Cl. 174—88 C 8 Claims



A connection for coaxial cables, which provides reduced return losses and is particularly suitable for cables having corrugated outer conductors. The connection maintains the inner diameter of the outer conductor substantially constant across the joint. A ferrule having an inner sleeve which is expanded to grip the outer conductor between the inner sleeve and an outer sleeve provides good mechanical and electrical connection to the outer conductor. A central tubular member, split into opposed halves, surrounds the joint between the inner conductors and nuts screw on the ends of the tubular member to connect the ferrules to the central tubular member.

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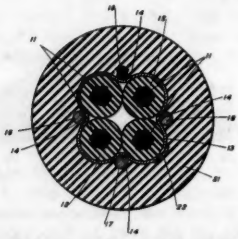
## 3,673,315
## SHIELDED CABLE

James A. Lasley, Richmond, Ind., assignor to Belden Corporation, Chicago, Ill.

Continuation of Ser. No. 755,252, Aug. 26, 1968, abandoned.
This application Sept. 8, 1970, Ser. No. 70,511
Int. Cl. H01b 11/10
U.S. Cl. 174—107 5 Claims

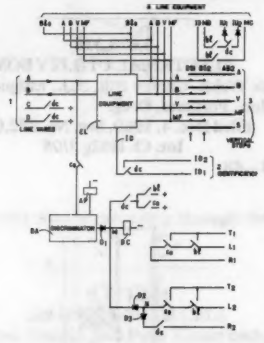


A shielded cable is described including a group of sheathed elongated conductors, a surrounding unitary conductive foil shield formed to follow the outer contour of the group of conductors, a plurality of drain wires extending along the outer surface of the shield in the recesses thereof, and an outer sheath of insulating material surrounding the drain wires and the foil shield.

## 3,673,316
## SWITCHING DEVICE FOR A DOUBLE OPERATION TELEGRAPHY SUBSCRIBER

Claude Rousseau, Joinville-Le-Pont, France, assignor to C.I.T.-Compagnie Industrielle des Telecommunications, Paris, France

Filed Nov. 28, 1969, Ser. No. 880,873
Claims priority, application France, Nov. 28, 1968, 68175811
Int. Cl. H04l 17/16
U.S. Cl. 178—2 R 10 Claims



Two-speed routing device for a telegraphic subscriber, enabling the use of the two modulation speeds, one called "normal" and the other called "fast," the fee being different in each case; this device, placed in a link-up exchange, comprises a single line equipment set whose inputs are linked with the input distributor, and a call discriminator element which controls the tripping of a discriminator relay ensuring the changing from one speed of use to another.

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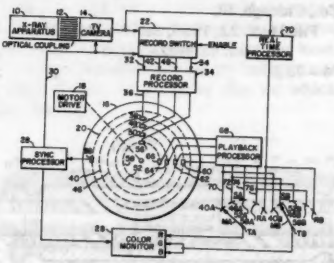
## 3,673,317
## COMPARITIVE DISPLAY OF IMAGES IN COLOR

George F. Newell, Pittsburgh, and Paul G. Kennedy, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 30, 1970, Ser. No. 102,621
Int. Cl. H04n 9/02, 7/18
U.S. Cl. 178—5.2 R 8 Claims



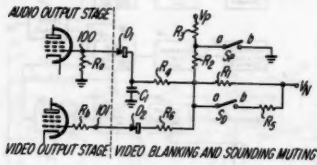
A system for the comparative display of video information wherein first video signals, e.g. corresponding to a first X-ray image, are compared with second video signals, e.g. corresponding to a second X-ray image, are applied to a display, such as a color television monitor, in such fashion that the difference between the first and second images is displayed in color while the common portion thereof are displayed in gray tones.

3,673,318

## VIDEO BLANKING AND SOUND MUTING CIRCUIT

Perry Charles Olsen, and Pak Chong Tang, both of Indianapolis, Ind., assignors to RCA Corporation

Filed Feb. 3, 1971, Ser. No. 112,178
Int. Cl. H04n 5/44
U.S. Cl. 178—5.8 R 10 Claims



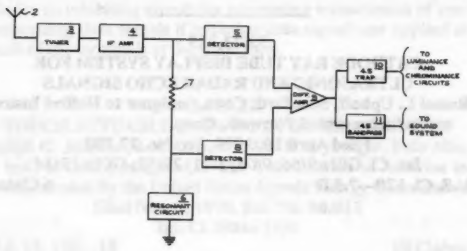

A switching circuit, dependent solely on the value of fixed impedances and supplied direct current voltages, blanks the picture and mutes the sound of a television receiver during its channel selection tuning, either manually or automatically by remote control.

3,673,319

## VIDEO COMPENSATION CIRCUIT FOR EMPHASIZED-CARRIER DETECTOR

John G. Humphrey, Chesapeake, Va., assignor to General Electric Company

Filed March 3, 1971, Ser. No. 120,464
Int. Cl. H04n 9/12
U.S. Cl. 178—5.4 R 11 Claims




An emphasized-carrier system for a television receiver which allows luminance, chrominance and sound signals to be detected in a common stage. The amplitude of the picture carrier frequency of an IF signal is increased with respect to the other frequencies thereof, and the resulting distorted signal is applied to a first detector device. The incremental change in the IF signal is abstracted and applied to a second detector device. The signals outputted by the two detectors are then subtracted in a differential amplifier to produce an undistorted detected signal.

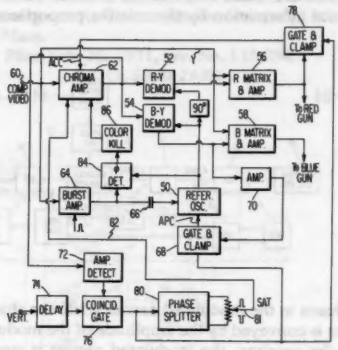
3,673,320

## TELEVISION APPARATUS RESPONSIVE TO A TRANSMITTED COLOR REFERENCE SIGNAL

Peter Swift Carnt, Herrliberg/Zurich, and George Schiess, Stallikon, both of Germany, assignors to RCA Corporation

Filed March 8, 1971, Ser. No. 121,842
Claims priority, application Great Britain, March 11, 1970, 11,689/70
Int. Cl. H04n 9/46
U.S. Cl. 178—5.4 HE 9 Claims

A color reference signal is inserted during the vertical blanking interval of a transmitted television waveform, for utilization by the described apparatus in automatically setting the hue and saturation of the diaplay of an NTSC or PAL receiver. The apparatus responds to the transmitted burst signal to lock the frequency of the sub-carrier oscillator of the receiver and to the transmitted reference signal to adjust the phase of its oscillations.

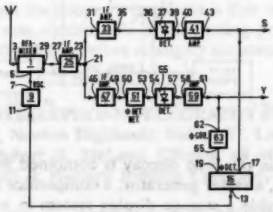



3,673,321

## TELEVISION RECIEVER WITH A PHASE DETECTOR HAVING DUAL PHASE DETERMINING AND CORRECTING NETWORKS

Peter Johannes Hubertus Janssen, Emmasingel Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed March 27, 1970, Ser. No. 23,335
Claims priority, application Netherlands, April 1, 1969, 6905094
Int. Cl. H04n 5/50
U.S. Cl. 178—5.8 A 7 Claims



An automatic frequency control circuit in a television receiver wherein an intercarrier signal is applied to each of two inputs of a phase detector, which intercarrier signals originates from two intermediate frequency signal paths which differ in that one of them includes a phase-determining network, while a phase correction circuit is incorporated in the signal path to one of the inputs of the phase detector so as to avoid variations at audio frequency in the output signal of the phase detector, which output signal serves as a control signal.

3,673,322

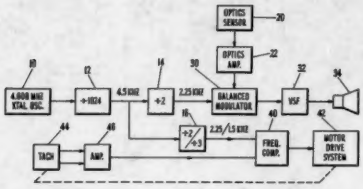
## FACSIMILE TRANSMISSION SYSTEM

Larry K. Baxter, Lexington, Mass., assignor to Shintron Company, Inc., Cambridge, Mass.

Filed May 28, 1970, Ser. No. 41,496
Int. Cl. H04n 1/00
U.S. Cl. 178—6 5 Claims

A facsimile transmission system employs a rotating drum at the transmitter upon which the original document is mounted

and a synchronously rotating drum at the receiver having marking means for producing the facsimile. "Video" signals obtained by scanning the original document with a photosensitive device are made to modulate a carrier to convey black and white information by the relative proportions of 0° and




180° phases in the modulated carrier while the shade of black or white is conveyed by the amplitude of the modulated carrier. At the receiver, the modulated carrier is synchronously demodulated to recreate the video signals which are then used to control the marking means so as to produce a facsimile of the original document.

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**3,673,323**

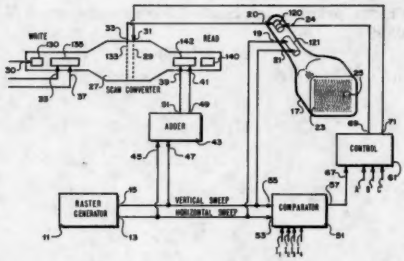
**STORAGE DISPLAY SYSTEM**

**Charles H. Gustafson, Manitou Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Sept. 23, 1970, Ser. No. 74,764**

**Int. Cl. H01j *31/60***

**U.S. Cl. 178—6.8** **2 Claims**




A cathode ray tube display is combined with a scan converter tube, a raster generator, a comparator and control circuit to provide a storage display system in which a selected portion of the display can be erased while simultaneously displaying information written on the unselected portion of the display. An adder circuit adds a selected amount of the horizontal sweep to the vertical sweep of the read raster and adds a selected amount of the vertical sweep to the horizontal sweep of the read raster to skew the read raster with respect to the display raster and thereby correct alignment defects in the scan converter tube.

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**3,673,324**

**VIDEO MIXING/SPECIAL EFFECTS AMPLIFIERS**

**Yutaka Ito, Saitama-ken, and Jun Hirate, Tokyo-to, both of Japan, assignors to Tokyo Broadcasting System Inc., Tokyo-to, Japan and Nippon Electric Company Limited, Tokyo-to, Japan**

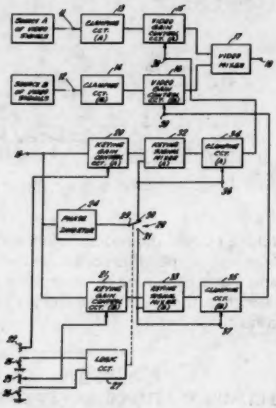
**Filed Dec. 22, 1970, Ser. No. 100,557**

**Claims priority, application Japan, Dec. 23, 1969, 44/104100**

**Int. Cl. H04n *5/22***

**U.S. Cl. 178—6.8** **8 Claims**

Amplifier apparatus for operating on plural video signals to provide signal mixing, special effects and the like employs parallel video signal processing circuits which supply their output signals to a common video mixer. A keying signal processor is included for developing control voltages for separately varying video gain in the video processing circuits



on a time shared basis. The composite arrangement thereby allows independent level control for the multi-channel video information vis-a-vis control signals such as synchronizing signals and/or a color burst.

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**3,673,325**

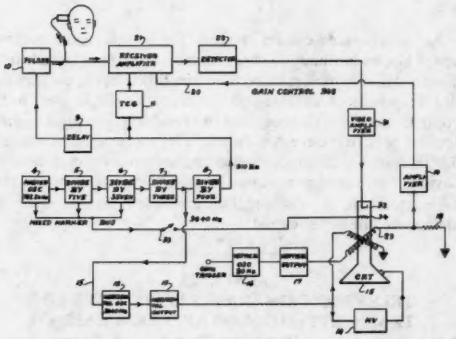
**CATHODE RAY TUBE DISPLAY SYSTEM FOR ULTRASONIC AND RADAR ECHO SIGNALS**

**Russel L. Uphoff, Stamford, Conn., assignor to Hoffrel Instruments Incorporated, Norwalk, Conn.**

**Filed April 10, 1970, Ser. No. 27,283**

**Int. Cl. G01s *9/66, 9/08*; H01j *29/52*; G01r *13/34***

**U.S. Cl. 178—7.5 D** **6 Claims**

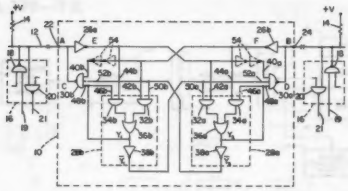



A system for displaying signals, particularly ultrasonic or radar echo signals, on a cathode ray tube, wherein a raster is constructed utilizing vertical and horizontal sweeps of suitable duration, intensity modulation of the electron beam is by application of the echo signals to the grid or cathode and modulation of the amplifier gain by one of the sweep waveforms or a waveform synchronous therewith to display the echo amplitudes on the raster.

## 3,673,326
## COMMUNICATION SYSTEM

Francis F. Lee, 35 Highland Ave., Lexington, Mass.

Filed Aug. 17, 1970, Ser. No. 64,374
Int. Cl. H04l 25/40
U.S. Cl. 178—71 R 21 Claims

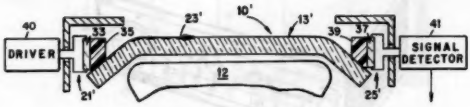


A bilateral repeater for connection in a transmission line arranged to transmit data between two spaced points includes a network having two inputs and two outputs. Each output is connected to a corresponding input at a terminal arranged for connection to the transmission line. The repeater also includes bilateral circuitry responsive to an initiating data signal applied via either of the terminals to an input for transmitting a corresponding data signal via an output to the other of the terminals only as long as the initiating data signal continues to be applied at the first terminal, and the bilateral circuitry includes an inhibiting circuit for preventing transmission of corresponding data signals if initiating data signals are applied at both of the terminals at the same time.

## 3,673,327
## TOUCH ACTUABLE DATA INPUT PANEL ASSEMBLY

Ralph G. Johnson, Los Altos, and David Fryberger, Palo Alto, both of Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Nov. 2, 1970, Ser. No. 86,011
Int. Cl. H04n 1/00
U.S. Cl. 178—18 10 Claims

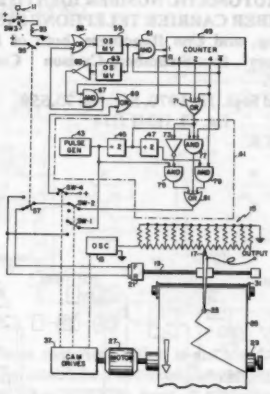



A panel positioned over the face of a cathode-ray tube with transmitters mounted along two adjacent edges of the panel to generate beams, either Rayleigh wave beams or light beams, that propagate through the panel to detectors mounted along opposite panel edges. The beams are directed to intersect in an X-Y matrix pattern. Interruption of intersecting beams by touching the panel at the intersection with a beam interrupting object, such as with a finger, develops discrete output signals at the two detectors that define the intersection. The output signals may be applied to a computer which may also be used to control the CRT to display various successive control panel patterns which have correspondence with the beam matrix intersections and are congruent with the intersections.

## 3,673,328
## RATE OF AMPLITUDE CHANGE CONTROL FOR AUDIOMETERS OF THE VON BEKESY TYPE

Rufus L. Grason, Lincoln, and Joseph Mihaly, Sudbury, both of Mass., assignors to Grason-Stadler Company, Inc., West Concord, Mass.

Filed Feb. 26, 1971, Ser. No. 119,290
Int. Cl. H04r 29/00
U.S. Cl. 179—1 N 10 Claims

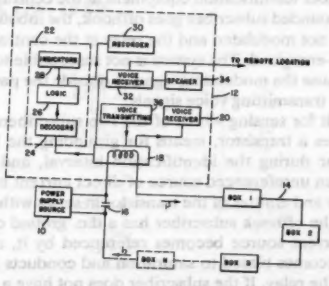



The rate of amplitude change control disclosed herein is adapted for use in an audiometer of the von Bekesy type in which the subject being tested controls the sense or direction of variation in test-tone amplitude, the amplitude level around which the subject hunts at each test-tone frequency being an accurate indication of the threshold of the subject's hearing at that frequency. The control of the present invention causes the rate of change of amplitude to itself vary from a relatively high rate to a relatively low rate as a test sequence progresses. In this way, a substantial amplitude range can be scanned in a short period until the subject's threshold is first reached and then a slower rate enables the final hunting procedure to proceed gradually and therefore relatively accurately.

## 3,673,329
## COMBINED TELEPHONE-TELEGRAPHY SYSTEM

Foster E. Weld, Newton Highlands; Robert W. Lassell, Westwood, and Robert B. McLeod, Clinton, all of Mass., assignors to Gulf & Western Systems Company, New York, N.Y.

Division of Ser. No. 403,316, Oct. 12, 1964, Pat. No. 3,384,714. This application Feb. 9, 1968, Ser. No. 714,151
Int. Cl. H04m 11/06
U.S. Cl. 179—3 6 Claims




A combined telephone-telegraphy system is disclosed herein and which includes a plurality of local calling boxes and

central station communication equipment connected together in a series circuit. Each local calling box includes telephone equipment for transmitting and receiving voice frequency signals to and from the central station equipment, as well as telegraphy means for transmitting coded box, identifying tone frequency signals to the central station equipment. Each local calling box also includes means for providing electrical power for the local calling box from current flow in the series circuit.

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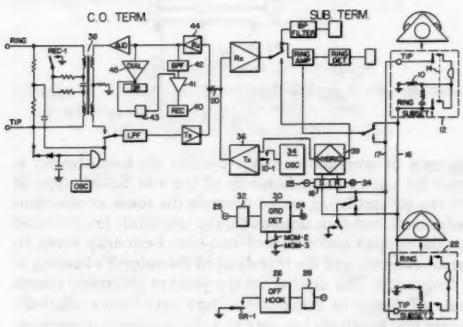
## 3,673,330

## TWO-PARTY AUTOMATIC NUMBER IDENTIFICATION IN SUBSCRIBER CARRIER TELEPHONE SYSTEM

**Morris A. Suntop, and Uno Randmere, both of Rochester, N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.**

**Filed Sept. 18, 1970, Ser. No. 73,559**
**Int. Cl. H04j 1/14**
**U.S. Cl. 179—2.5 R** **3 Claims**




Automatic number identification for two subscribers who share a single channel in a subscriber carrier system. A d.c. ground connection is made to the subset of one of the two subscribers but not to the other's. When the subscriber having the ground connection goes offhook, initiating transmission of the inbound carrier signal, the subscriber equipment modulates the inbound carrier for a brief interval with a signal at a frequency higher than the highest voice signal permitted on the line. The subscriber carrier terminal equipment at the central office responds to the modulating signal by actuating a relay which remains held up for the duration of the call and effects a ground connection detectable by the conventional automatic number identification equipment at the central office. If the non-grounded subscriber goes offhook, the inbound carrier signal is not modulated and the relay at the central office remains non-energized. The system is not susceptible to "talk-down," because the modulating signal is outside the pass band provided for transmitting voice signals.

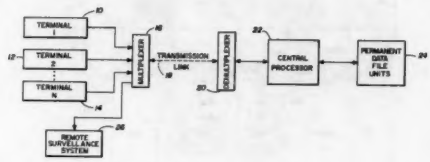
The circuit for sensing which of the two subscribers is offhook includes a transistor, means for grounding the base of the transistor during the identification interval, and means connecting an unreferenced source of direct current between the collector and emitter of the transistor in series with a relay winding. If the offhook subscriber has a d.c. ground connection, the current source becomes referenced by it, and the transistor becomes biased to saturation and conducts current to energize the relay. If the subscriber does not have a ground connection, the current source is referenced only through the base connection and the transistor does not conduct.

## 3,673,331

## IDENTITY VERIFICATION BY VOICE SIGNALS IN THE FREQUENCY DOMAIN

**George D. Hair, Irving, and James U. Kincaid, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Jan. 19, 1970, Ser. No. 3,991**
**Int. Cl. G10l 1/04, 1/08**
**U.S. Cl. 179—15 B** **36 Claims**




Voice verification is accomplished at a plurality of spaced apart facilities each having a plurality of terminals. Multiplexing structure interconnects the terminals through a communications link to a central processing station. Analog reproductions of voices transmitted from the terminals are converted into digital signals. The digital signals are transformed into the frequency domain at the central processing station. Predetermined features of the transformed signals are compared with stored predetermined features of each voice to be verified. A verify or non-verify signal is then transmitted to the particular terminal in response to the comparison of the predetermined features.

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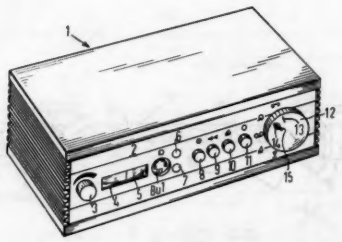
## 3,673,332

## TELEPHONE ANSWERING DEVICES

**Willy Muller, Zollikon/Zurich, Switzerland; Bruno Wurm, Dachau-Rothschwaige, and Hermann Haag, Dachau/Buchengassel, both of Germany, assignors to Willy Muller, Zollikon, Switzerland**

**Filed June 3, 1969, Ser. No. 830,049**
**Int. Cl. H04m 1/64**
**U.S. Cl. 179—6 E** **8 Claims**

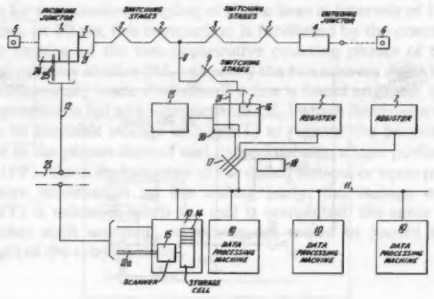



A device for automatic telephone answering which is adapted to play over a text which has been pre-recorded by the user of the device and which can also replay upon command via telephone, messages recorded by callers when actuated by code impulses transmitted through the telephone line. In particular, the present system permits stored messages to be played back and erased by remote control. To effect these functions cyclically the system combines a magnetic recording unit with mechanical drive means in an integrated constructional assembly. In this system, the answering unit and associated means effecting recording and drive thereof are combined into an integrated assembly with control means.

## 3,673,333
## ACCOUNTING SYSTEM FOR TELEPHONIC EXCHANGES

Guy Jean Le Strat, Lannion, and Roger Desplanques, Velizy, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 17, 1969, Ser. No. 885,822
Claims priority, application France, Dec. 18, 1968, 68178920
Int. Cl. H04m *15/06*
U.S. Cl. 179—7 R 4 Claims

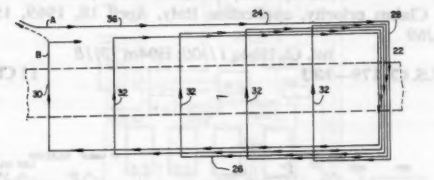


An automatic toll ticketing system provides means for transfering charge information from registers, incoming links and a rate of charge indicator, to a programmed data-processing machine. In case where the transfer is not possible, a second attempt is made, and if insuccessful, a fault signal is provided and busy tone is sent to the subscriber.

## 3,673,334
## ANTENNA FOR USE WITH AN AUDIO INDUCTION COMMUNICATION SYSTEM

Justin L. Turner, Branford, Conn., assignor to Educational Service Programs, Inc., New Haven, Conn.

Filed March 19, 1971, Ser. No. 126,028
Int. Cl. H04b *5/00*
U.S. Cl. 179—82 16 Claims

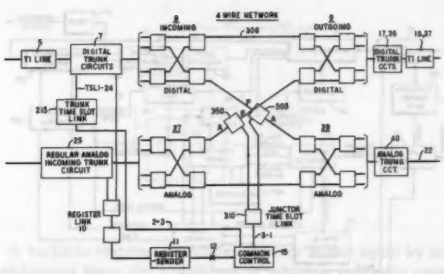


An antenna for use with an audio induction communication system provides a communication field of substantially uniform strength at all points within a given pick-up zone along which receiver-equipped persons are expected to travel or within which such persons are expected to stand while receiving a message through their receivers. The antenna comprises a continuous wire located in the vicinity of the pick-up zone and preferably buried beneath the surface of the earth defining the pick-up zone. The wire is disposed in a plurality of loops each of which loops includes two portions crossing the zone at two different points, such zone-crossing loop portions being arranged so as to include a spaced series of such portions located along the length of the zone and through which the exciting current passes in the same direction, those zone-crossing loop portions through which the exciting current passes in the opposite direction being closely grouped together at one end of the zone.

## 3,673,335
## SWITCHING OF TIME DIVISION MULTIPLEX LINES AND ANALOG TRUNKS THROUGH TELEPHONE CENTRAL OFFICES

Amos Edward Joel, Jr., South Orange, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 24, 1970, Ser. No. 66,192
Int. Cl. H04j *3/00*
U.S. Cl. 179—15 AQ 8 Claims

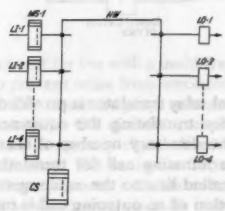


A telephone switching office is disclosed wherein connections may be established between conventional analog trunks and time division multiplex lines. A plurality of digital trunks are employed equal in number to the number of incoming and outgoing time slot channels to be switched through the office. Digital trunks associated with incoming channels are provided with shift registers for storing the bit patterns carrying the information for a respective time slot. This information is outpulsed from the shift registers under control of readout pulses derived from a trunk time slot switch which is set by common control to deliver readout pulses in a time sequence that is appropriate to the selected time slot in the outgoing TDM line to which a cross-office connection is desired. In addition, conversion junctor circuits are provided having encoders and decoders which are selectively gated to deliver the digital information to the appropriate time slot of the TDM line involved in the connection by signals derived from a junctor time slot switch whose operation is dictated by common control Advantageously, both the trunk time slot link switch and the junctor time slot link switches are of the crossbar type.

## 3,673,336
## TIME DIVISION MULTIPLEX SWITCHES

David Michael Thomas, Bayshore, Ottawa, Canada, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 12, 1970, Ser. No. 79,728
Claims priority, application Great Britain, Oct. 21, 1969, 51,628/69
Int. Cl. H04j *3/08*
U.S. Cl. 179—15 BD 3 Claims



A time division multiplex (TDM) switch is provided which serves a number of highways. Individual subscriber loops are

connectd to the TDM switch in place of some of the TDM channels on the highways. This enables the ratio of TDM channels to individual loops to be altered conveniently.

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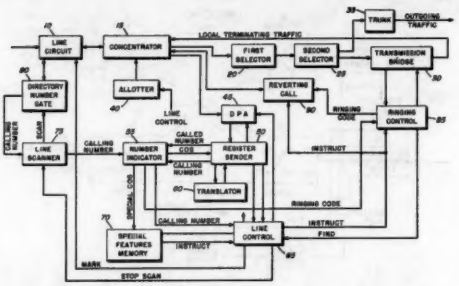
## 3,673,337
## REVERTING CALL ARRANGEMENT

James Gordon Pearce, Liverpool, England, assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Oct. 12, 1966, Ser. No. 586,210
Int. Cl. H04m 3/02
U.S. Cl. 179—17 D 10 Claims




A reverting call arrangement for a common control telephone system which is automatically connected to the calling line circuit shared by calling and called parties along with the selected dial pulse acceptor or register and includes a control bridge relay forming a d.c. loop with the calling line circuit, reverting call relay means responsive to control from the common control and actuation of the control budge relay for connecting a ringing control providing both calling and call party ringing to the calling line circuit, and holding means for holding connection to the calling line circuit during processing of the reverting call.

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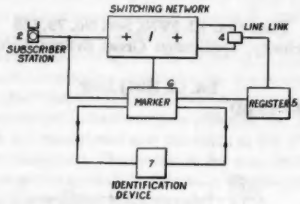
## 3,673,338
## BI-DIRECTIONAL TRANSLATOR CIRCUIT

Evert Oskar Ekbergh, Dr. Widerstroms gata 70, Hagersten, and Per Gustaf Jonsson, Sorlid, Ronninge, both of Sweden

Filed Aug. 1, 1969, Ser. No. 51,027
Claims priority, application Great Britain, Aug. 1, 1968, 36,736/68
Int. Cl. H04q 3/47
U.S. Cl. 179—18 ET 4 Claims




A bi-directional relay translator is provided which responds to a local call for translating the equipment number of a calling line to the directory number of that line and which responds to a terminating call for translating the directory number of the called line to the equipment number of that line. The translation of an outgoing call is initiated by operation of the calling line relay which provides an equipment number identification, following which a translation to decimal directory number is effected. In the reverse direction, when a directory number is registered, completion of the registration initiates a translation of the decimal directory number to an equipment number.

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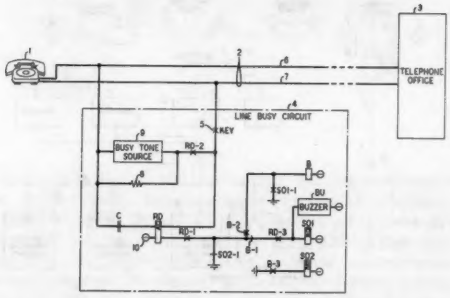
## 3,673,339
## ARTIFICIAL LINE BUSY CIRCUIT

Franklin Adam Korn, Columbus, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 22, 1970, Ser. No. 57,036
Int. Cl. H04m 1/00
U.S. Cl. 179—18 F 10 Claims




Auxiliary line circuitry is disclosed for making a customer telephone line appear busy for timed periods and only in response to incoming calls. The circuitry is activated by incoming call ringing for connecting a bridge network to the customer line for applying a busy tone thereto, immediately tripping ringing and retaining a timed off-hook signal on the line following a calling party disconnect. Thereafter, the bridge network causes a permanent signal to be automatically originated for making the customer phone appear busy for a period controlled by timers in the auxiliary line circuitry.

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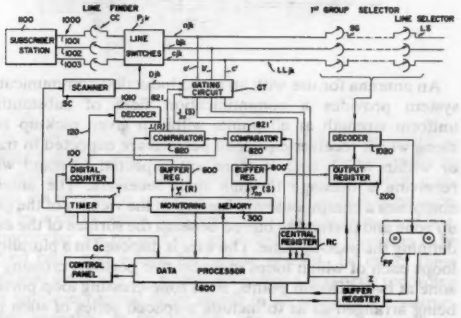
## 3,673,340
## DATA-EVALUATION SYSTEM FOR TELEPHONE EXCHANGE

Luigi Casella; Aldo Perna, and Giuseppe Valbonesi, all of Milan, Italy, assignors to Societa Italiana Telecommunicazioni Siemens SpA, Milan, Italy

Filed April 20, 1970, Ser. No. 30,132
Claims priority, application Italy, April 18, 1969, 15735 A/69
Int. Cl. H04q 11/00; H04m 15/18
U.S. Cl. 179—18 J 11 Claims




A monitoring memory (300) of the circulating type has a first section ($M_C$) with 100 phases for the activities of as many

local lines identified by two-digit decimal numbers, a second section ($M_R$) subdivided into several multiphase storage units (RET) for receiving, evaluating and transmitting information relating to a call involving an associated local line, and a third section ($M_S$) carrying supplemental information such as the time of day. With 800 phases circulating at a rate of one memory cycle per 800 $\mu$s, two consecutive counting phases in the third memory section are stepped once per cycle to produce, consecutively, the 100 line-identification numbers or addresses 00–99. A digital counter (**100**), operating in synchronism with the first section of the monitoring memory, periodically delivers the addresses of the 100 local lines to a comparator (**820**) matching them with the progressively changing address information stored in the third memory section for a successive sampling of all the lines at intervals of 100 cycles, or 80 ms; this comparison is facilitated by the concurrent tapping of the two consecutive counting phases of the third memory section ($M_S$) whereby the two address digits are simultaneously made available. If a line is found engaged, this information is fed to a logic network ($E_C$) which thereupon seizes an available storage unit (RET) to register the pertinent data in the phases thereof and to feed them to a tape perforator (PF). Upon the response of the called station, or upon premature termination by the calling party, the storage unit (RET) is released; when the call is completed, the same or another such unit and perforator are seized to record the length of the conversation.

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**3,673,341**

## CALL RE-ROUTING SYSTEM FOR TELEPHONE INSTALLATIONS

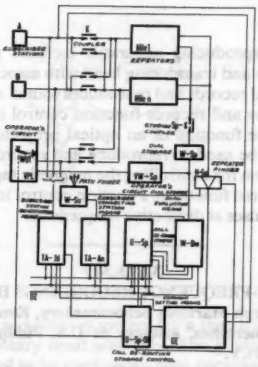
**Dieter Finkhauser, Wolfratshausen, and Andre Friese, Gauting, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany**

**Filed May 6, 1968, Ser. No. 726,918**

**Claims priority, application Germany, May 12, 1967, S 109850**

**Int. Cl. H04m *3/54***

**U.S. Cl. 179—18 BE** **4 Claims**



A call re-routing system for communication installations having central storage means with storage locations permanently assigned to subscriber stations. Information stored in these locations determines re-routing of calls to the corresponding stations from the latter station to the station location identified in said storage means, and may be changed at will for cancellation or further re-routing of calls from any subscriber station.

**3,673,342**

## CIRCUIT ARRANGEMENT FOR IMPROVING THE SIGNAL-TO-NOISE RATIO OF A STEREO DECODER

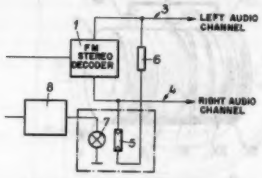
**Karl Muller, Frankfurt/Main-Niederrad, Germany, assignor to Braun Aktiengesellschaft, Frankfurt/Main, Germany**

**Filed July 30, 1970, Ser. No. 59,631**

**Claims priority, application Germany, Aug. 2, 1969, P 19 39 422.0**

**Int. Cl. H04h *5/00***

**U.S. Cl. 179—15 BT** **13 Claims**




A variable resistor, a photoconductor shone upon by an incandescent lamp the brightness of which is inversely proportional to the carrier strength, or a variable time constant RC-network is connected to the stereo decoder to vary the stereo separation in direct proportion to the carrier strength.

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**3,673,343**

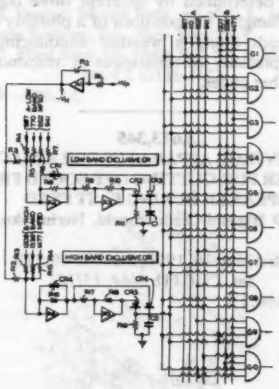
## ANTI-JAMMING CIRCUIT FOR MULTI-FREQUENCY SIGNAL DETECTOR

**Robert E. Vosteen, 315 W. Center St., Medina, N.Y.**

**Filed Nov. 21, 1968, Ser. No. 777,770**

**Int. Cl. H04m *1/00***

**U.S. Cl. 179—84 VF** **11 Claims**




A jam-proof circuit for use with a multi-frequency signal detector system to prevent noise from erroneously actuating the detector system. The circuit employs substantially similar high and low-band exclusive OR circuits interposed between the output of the multi-frequency signal detector means and associated logic circuitry. The exclusive OR circuitry prevents noise from causing erroneous indications to be produced by the logic circuitry which comprises an individual AND gate corresponding to each digit that may be signalled. The digits are identified by the simultaneous transmission of a plurality of different frequencies.

3,673,344

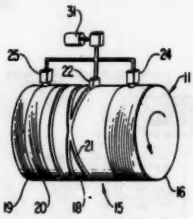
## HEAD POSITIONING MECHANISM FOR RECORDED ANNOUNCEMENT APPARATUS

Leary W. Smith, and Ellis H. Bryant, Jr., both of 721 Miami Circle N.E., Atlanta, Ga.

Division of Ser. No. 10,386, Feb. 11, 1970. This application Dec. 7, 1971, Ser. No. 205,597

Int. Cl. G11b 21/04

U.S. Cl. 179—100.1 C 9 Claims




An announcing system for providing a family of recorded announcements through telephone central office equipment to one or more telephone subscriber lines. Each announcement selectively includes weather, temperature, or other periodic and aperiodic information segments. Each announcement is changeable in length from a long cycle which includes a full advertising segment to a short cycle in which a major portion or all of the advertising segment is deleted so that the time required for an announcement is shortened. The length of the announcement cycle is shortened in response to the number of subscriber lines waiting to be connected to the announcing system being in excess of the number of subscriber lines which can be connected to the announcing system by the telephone central office equipment. However, the announcing system also provides for deleting segments of an announcement which are in error without changing the length of the announcement cycle or it being apparent that the announcement segment has been deleted. The weather segment of the announcement is determined by different three digit weather codes and by changing the positions of a plurality of weather announcing heads along a weather announcing drum in response to a plurality of resistances corresponding to the three digit weather codes.

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3,673,345

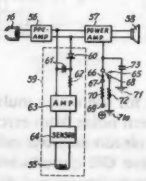
## SOUND CONTROL APPARATUS FOR A MAGNETIC TAPE PLAYER FOR CUTTING OFF SOUND FROM THE SPEAKER DURING FAST FEED

Itsuki Ban, 829 Higashi-Oizumimachi, Nerima-ku, Tokyo-to, Japan

Filed May 26, 1970, Ser. No. 40,523

Int. Cl. G11b 5/44, 15/10

U.S. Cl. 179—100.2 S 3 Claims




A reproducing output sound control apparatus for a magnetic tape player which is capable of enabling the magnetic tape to change from a normal driving to a fast driving comprises a tape speed changing device operatively changing over the tape speed from normal to fast and vice versa, and a circuit incorporated in a tape reproducing circuit including a switch operable in association with operation of the tape speed changing device, and a condenser and its power supply, the tape speed changing device being operable when changed into a condition that the tape is fast driven to change the switch into a condition that the current supply to the tape reproducing circuit is broken off and to discharge the condenser thereby breaking off the output of the tape reproducing circuit, the tape reproducing circuit slowly becoming operative in connection with the charge of the condenser when the tape speed changing device is changed into a condition that the tape is normally driven.

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3,673,346

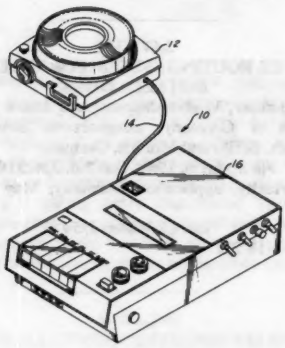
## SOUND REPRODUCING AND OPTICAL PROJECTOR FUNCTION CONTROL APPARATUS

Hershel Gordon, Cheltenham Township, and Charles R. McAdoo, Jr., Holland, both of Pa., assignors to Optisonics Corporation, Montgomeryville, Pa.

Filed April 13, 1970, Ser. No. 27,583

Int. Cl. G03b 31/06; G11b 31/00

U.S. Cl. 179—100.2 S 10 Claims




A sound reproducing apparatus includes a two channel magnetic tape and transducing head with associated circuitry. A first channel records and reproduces sound. A second channel reproduces and records function control information for controlling the function of an optical projector. The second channel may be used to reproduce and record function control information for controlling the magnetic tape drive motor, or other selected functions. Function control information is in the form of pulses at distinctive frequencies.

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3,673,347

## HIGH-FREQUENCY RECORDINGS DEVICE

Johannes Joseph Martinus Schoenmakers, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 23, 1970, Ser. No. 49,129

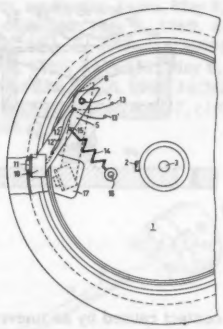
Claims priority, application Netherlands, June 27, 1969, 6909886

Int. Cl. G11b 5/52, 5/54, 23/12

U.S. Cl. 179—100.2 T 8 Claims

An apparatus for recording and/or reproducing video signals on or from a magnetic tape which is helically wound around a cylindrical drum. The drum comprises two axially aligned drum parts which are separated by a gap in which at least one magnetic head rotates during operation. The magnetic head is arranged on an arm which is pivotably mounted on a rotatable disc and which is in a retracted position when

the disc is stationary and pivots outwards under the influence of the centrifugal forces when the disc is rotating. The magnetic head is positioned with respect to the tape by means of abutment faces which are provided on the inner surfaces of



the drum parts adjacent the gap and cooperate with the pivoting arm. Drum parts and magnetic tape are preferably accommodated in a cassette which is placed on an apparatus which includes the head disc.

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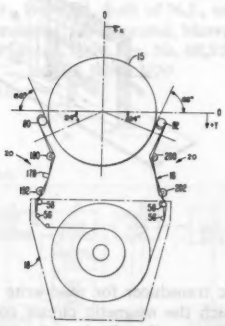
**3,673,348**

**VIDEO TAPE PICK-UP AND GUIDE SYSTEM FOR CARTRIDGE TYPE REPRODUCING AND/OR RECORDING SYSTEM**

**Thomas J. Larkin, San Jose, Calif., assignor to Cartridge Television, Inc., New York, N.Y.**

**Filed June 26, 1970, Ser. No. 50,058**
**Int. Cl. G11b** *5/52, 23/06*
**U.S. Cl. 179—100.2 Z** **10 Claims**



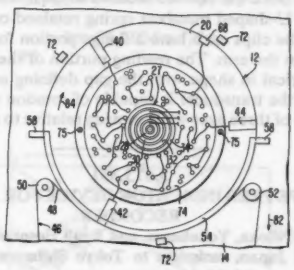
A tape guide and pick-up system for a tape transport of the type having a rotary head assembly. The guide and pick-up system is adapted to be used with a tape cartridge from which a stretch of tape is removed and advanced into a position adjacent to the paths of travel of a rotary head of the head assembly to permit the head to scan the tape stretch as the latter moves relative to the assembly. The guide system includes a number of spaced guides which orient the tape in a manner to cause it to be presented to the head assembly at a helical angle, whereby the tape tracks scanned by the heads will be oblique relative to the longitudinal axis of the tape stretch. The cartridge has an improved brake operated by control means forming a part of the tape transport to cause the tape reels in the cartridge to stop quickly after a tape rewind or fast-forward operation.

**3,673,349**

**ROTARY HEAD ASSEMBLY FOR TAPE TRANSPORT WITH AMPLIFIER CARRIED BY THE ROTOR**

**Peter Berg, San Jose, and Bertil C. Linder, Milpitas, both of Calif., assignors to Cartridge Television, Inc., New York, N.Y.**

**Filed June 26, 1970, Ser. No. 50,060**
**Int. Cl. G11b** *5/44, 15/12*
**U.S. Cl. 179—100.2 T** **10 Claims**



An assembly for mounting a number of magnetic heads on a rotor for rotation about a central axis and for electrically connecting the heads to a commutator on the rotor wherein the heads are secured to the rotor adjacent to its outer periphery for scanning a flexible, magnetic tape disposed adjacent to and along a portion of the arcuate path of travel of the heads. Amplifier means carried by the rotor electrically couples the commutator with each head, respectively. A switch network can be carried by the rotor and actuated by a transducer to effect sequential switching between the heads as a function of the rotation of the rotor.

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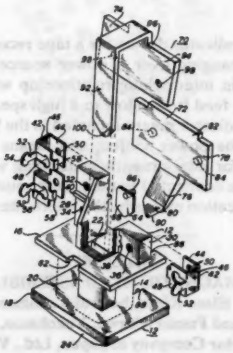
**3,673,350**

**MAGNETIC TRANSDUCER ARMATURE**

**Stephen Bartok, Clifton; Melvin Kamenir, West Orange, and Andrew J. Begoss, Mount Fern, all of N.J., assignors to Litton Business Systems, Inc., New York, N.Y.**

**Filed Sept. 16, 1969, Ser. No. 5,382**
**Int. Cl. G11b** *5/22*
**U.S. Cl. 179—100.2 C** **7 Claims**



A handheld magnetic transducer comprises a gun-shaped housing having a directional arrow on one surface. The arrow is illuminated by a light within the housing indicating the

operating state of the transducer as determined by a signal device. The housing has dimples in opposed side walls for ease of grasping. The armature is in two parts. Each part has a T-shaped portion the crossbars of which overlap. The armature is inserted within the bobbin and is resiliently held at the crossbars to lock into position with a shim. The bobbin front wall in combination with the armature and shim form the muzzle or reading end of the transducer and has a substantially frustro pyramidal shape. The armature-bobbin structure is held in place by fingers which form a part of the transducer housing. The wires from the coil are secured to clips. The clips or terminal are U-shaped members spring retained on arms of the bobbin. The clips each have a flange portion for engaging an aperture in the arm. The reading portion of the transducer is hemispherical in shape with the gap defining an arc thereon such that the transducer is capable of rotation or positioning about one of three axes while moving relative to a record.

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**3,673,351**

## TAPE FEED INDICATOR DEVICE FOR A TAPE RECORDER

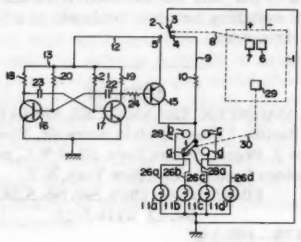
**Takeharu Niioka, Yokohama, and Ryoji Hosokawa, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan**

**Filed March 26, 1971, Ser. No. 128,438**

**Claims priority, application Japan, March 27, 1970, 45/28929**

**Int. Cl. G08b 5/38; G11b 5/28**

**U.S. Cl. 179—100.2 R** **4 Claims**



A tape feed indicator device for a tape recorder comprising a switch for changing over a power source to a first or a second circuit in interlocking relationship with a device for changing a tape feed from a low to a high speed or vice versa; low tape feed indicator means included in the first circuit to be controlled by the power source; and means included in the second circuit for intermittently generating voltage when the second circuit is connected to the power source, thereby controlling the indication means by the intermittent voltage.

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**3,673,352**

## MAGNETIC HEAD ASSEMBLY

**Yoshiyo Wada; Hisao Kinjo, both of Yokohama; Toshi Suzuki, Kamakura, and Fumio Akuwa, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan**

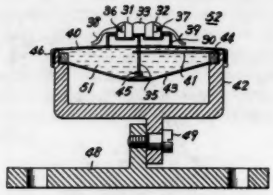
**Filed July 9, 1970, Ser. No. 53,552**

**Claims priority, application Japan, July 11, 1969, 44/54578**

**Int. Cl. G11b 5/10, 5/58**

**U.S. Cl. 179—100.2 C** **13 Claims**

A magnetic head assembly comprises at least one resilient film-like member held in tension over a drum-shaped support. A magnetic head holder and at least one head core are provided on an upper resilient member. The head core can follow



the variation of contact caused by an uneveness of the magnetic surface of a magnetic medium.

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**3,673,353**

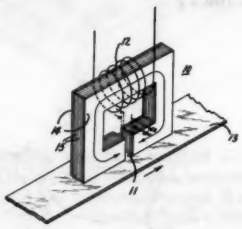
## MAGNETIC TRANSDUCER HAVING A COMPOSITE MAGNETIC CORE STRUCTURE

**Jerome J. Tiemann, Schenectady, N.Y., and Louis G. Gitzendanner, Oklahoma City, Okla., assignors to General Electric Company**

**Filed July 16, 1970, Ser. No. 55,362**

**Int. Cl. G11b 5/16, 5/24**

**U.S. Cl. 179—100.2 C** **2 Claims**

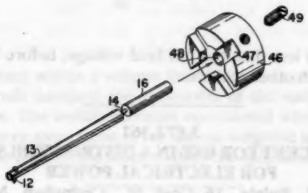


A magnetic transducer for read-write applications is disclosed in which the magnetic circuit comprises a stack of laminations of generally "C" shape having a read-write winding inductively associated therewith. The read-write gap is provided by the opposed ends of the stacked laminations, and the laminations are of two different types; that is, they have different magnetic characteristics and are preferably of different materials. The outer laminations have relatively low initial permeability relative to the remaining laminations so that they are ineffective during the read operation but have sufficiently low coercive force so that they are magnetized during the write operation. The inner laminations of the stack have relatively high initial permeability so that they are magnetized during the read operation. In this way, the effective height of the stack and, accordingly, the width of the read-write gap is narrower during the reading operation than it is during the writing operation, being essentially equal to the total stack for writing and essentially equal to the inner laminations for reading.

## 3,673,354
## SEMICONDUCTOR STRESS TRANSDUCER

Fujio Oda, Ashiya, and Shuichi Obata, Kyoto, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 4, 1970, Ser. No. 34,505
Claims priority, application Japan, May 8, 1969, 44/36846; May 8, 1969, 44/36847; May 8, 1969, 44/36848; May 8, 1969, 44/36849; May 8, 1969, 44/36850; May 8, 1969, 44/36851; May 8, 1969, 44/36852; May 8, 1969, 44/36853; May 8, 1969, 44/36854; May 8, 1969, 44/36855
Int. Cl. H04r 1/16, 9/12, 11/08
U.S. Cl. 179—100.41 V 9 Claims

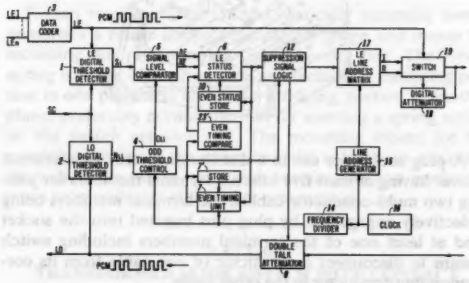



A semiconductor stress transducer having a pair of spaced electrodes disposed on an electrically insulating thin-film base of a flexible nature, a semiconductor piezo-resistive film being evaporated across the electrodes, means for applying an external stress to the evaporated semiconductor film so that a change in the external stress causes a change in the tension of the semiconductor film, and means for deriving an electrical signal from the electrodes due to a change in the internal resistance of the semiconductor film response to the change in the externally applied stress.

## 3,673,355
## COMMON CONTROL DIGITAL ECHO SUPPRESSION

Robert Ernest La Marche, Atlantic Highlands, and Carl Jerome May, Jr., Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 2, 1970, Ser. No. 68,921
Int. Cl. H04b 3/20
U.S. Cl. 179—170.6 17 Claims

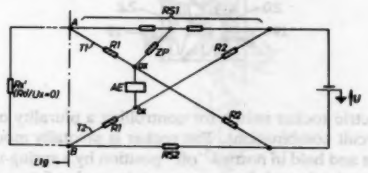



Circuitry for accomplishing digital echo suppression for a plurality of two-way transmission circuits is disclosed. Analogue signal levels on each line of each associated transmit-receive pair are periodically converted into pcm codes and applied to common time-shared circuitry, which includes a time-divided memory, in the time slot allocated for that pair. The common circuitry translates the pulse codes into echo suppressor control signals by combining them with code signals representing the past signal bearing statuses of the lines and timing signals stored in the time-divided memory to determine if the respective present activity statuses of the line pair are such that echo suppression is required.

## 3,673,356
## LOOP MONITOR CIRCUIT

Eberhard Herter, Stuttgart, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 5, 1969, Ser. No. 855,721
Claims priority, application Germany, Sept. 19, 1968, P 17 62 897.6
Int. Cl. HO4m 1/24
U.S. Cl. 179—175 5 Claims

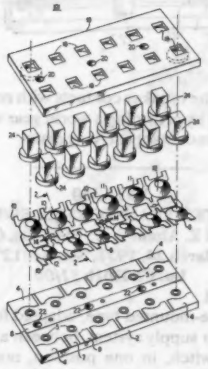



A circuit for determining the resistance of a loop by connecting the loop terminals through like resistances to respective poles of a voltage source. Each terminal is also connected to the opposite pole of the source through a voltage divider, the dividers being symmetrical. An evaluating device is bridged across taps in the voltage dividers, the taps being positioned to produce like resistive ratios in the dividers.

## 3,673,357
## TACTILE RESPONSE SWITCH WITH UNITARY CONTROL STRIP OF INDEPENDENTLY OPERABLY PLURAL DISC CONTACTS

Andrew John Molchan, Indianapolis, Ind., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed March 29, 1971, Ser. No. 128,997
Int. Cl. H01h 5/30
U.S. Cl. 200—5 A 4 Claims



A tactile response switch comprises a unitary cantilever-snap disc mechanism in which the cantilever provides reliable electrical contact properties and the snap disc provides a tactile response to contact closure. A plurality of independent contact closures can be made by operation of a single contact button and the properties of the cantilever and the snap disc

can be easily tailored to achieve a desired sequence of contact closures and desired switch operating characteristics.

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**3,673,358**

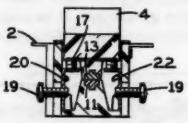
**ELECTRIC ROCKER SWITCH FOR CONTROLLING MULTIPLE CIRCUITS WITH MAGNETIC COUPLING MEMBERS**

**James R. Harmon, 10040 S. W. 40th St., Miami, Fla.**

**Filed March 31, 1971, Ser. No. 129,883**

**Int. Cl. H01h** *9/54*

**U.S. Cl. 200—6 R** **2 Claims**




An electric rocker switch for controlling a plurality of different circuit combinations. The rocker is pivotally mounted in a frame and held in normal "off" position by a spring-urged member and adapted for movement in each of two "on" directions including a permanent magnet mounted in each end of the rocker, positioned to engage mating magnets for holding the rocker in each of its two "on" positions. The rocker contains a plurality of contacts to engage mating contacts in the body of the switch, which contacts may be connected to control a plurality of different circuits.

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**3,673,359**

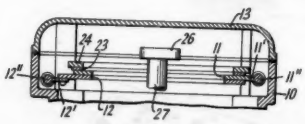
**ENGINE IGNITION TIMER WITH IMPROVED ADJUSTABLE PLATES**

**Vernon C. Wickman, Milwaukee, Wis., assignor to AMF Incorporated**

**Filed Jan. 4, 1971, Ser. No. 103,499**

**Int. Cl. H01h** *19/00*

**U.S. Cl. 200—19 R** **3 Claims**




The position of the breaker contacts with respect to the timing cam is adjusted by providing a worm gear set for adjustably rotating the breaker contact carrying plate.

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**3,673,360**

**BOOSTER TRANSFORMER SWITCH**

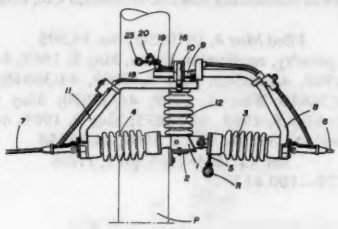
**John G. Pahl, 1624 E. Alpine Ave., Stockton, Calif.**

**Filed March 24, 1971, Ser. No. 127,667**

**Int. Cl. H01h** *31/00*

**U.S. Cl. 200—48 R** **7 Claims**

A switch, of pole-mounted type, adapted for connection, in an electrical power supply system, between a feed cable and a load cable; the switch, in one position, normally providing direct connection between the feed cable and the load cable, and, in another position, breaking such direct connection and establishing a by-pass connection —including a booster transformer—between the feed cable and load cable whereby to "-boost" the current value in said load cable under a condition of undue voltage drop therein. The switch also provides a shunt operative to prevent the load cable from being taken completely out-of-circuit as the switch is actuated from said one position to such other position; said shunt—which includes a resistor—also serving to preload the booster trans-




former, with less than the full feed voltage, before the switch closes in such other position.

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**3,673,361**

**PLUG SOCKET FOR USE IN A DISTRIBUTOR SYSTEM FOR ELECTRICAL POWER**

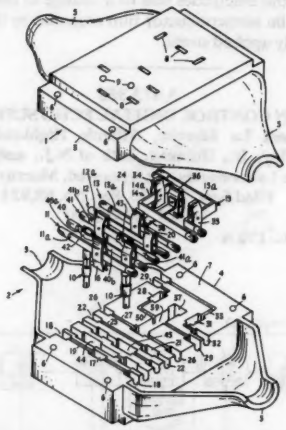
**Reginald W. Bulgin, 16 Cook St., Caringbah, New South Wales, Australia**

**Filed May 4, 1970, Ser. No. 34,004**

**Claims priority, application Australia, May 7, 1969, 54560/69**

**Int. Cl. H01r** *19/50*

**U.S. Cl. 200—51.03** **7 Claims**



A plug socket for use in a distributor system for electrical power having at least five internal terminal members for joining two multi-conductor cables, the terminal members being selectively engageable by plug pins inserted into the socket and at least one of the terminal members including switch means to disconnect a conductor of one cable from its corresponding conductor in the other cable.

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**3,673,362**

**ELECTRIC IMPACT SWITCH**

**Robert J. Carlson, Somerville, and Royal A. Reymann, Jr., Wharton, both of N.J., assignors to The United States of America as represented by the Secretary of the Army**

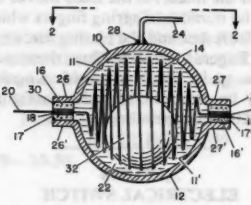
**Filed May 14, 1971, Ser. No. 143,374**

**Int. Cl. H01h** *35/14*

**U.S. Cl. 200—61.45 R** **7 Claims**

This invention relates to an omni-directional intermittent,

normally open electric impact switch having two hollow hemispherical terminal means which are circumambient to and insulated from a weighted helical spherically shaped spring which acts as the pole piece of the switch. A non-conducting



fluid retained within a volume formed by the two hemispherical terminals dampens the movement of the weighted spring pole piece. The switch becomes operational when an impact causes one or more turns of the helical weighted spring pole to deflect and contact the inner walls of the spherical terminal.

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**3,673,363**

**RETURN MECHANISM FOR AN AUTOMATICALLY RETURNING SWITCH**

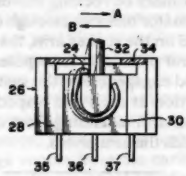
**Tadahisa Nakamura; Hirozi Fujimoto; Makoto Yamamoto, and Yukito Shintomi, all of Kawasaki, Japan, assignors to Fujisoku Electric Co., Ltd., Kawasaki-shi, Japan**

**Filed June 1, 1970, Ser. No. 42,022**

**Claims priority, application Japan, May 31, 1969, 44/50820; Dec. 4, 1969, 44/115383**

**Int. Cl. H01h** *3/00*

**U.S. Cl. 200—153 K** **5 Claims**



Return mechanism for an automatically returning switch comprises a return spring of particular shape and means for mounting this return spring on the switch box. The return spring is made of a spring wire and includes a mounting portion in one plane and an arm, or bridging, portion in another plane, preferably normal thereto, for exerting a spring action on the switch actuator rod. The mounting means for the mounting portion of the spring includes at least one groove in the wall of the switch box which permits one arm portion to move independently of the other arm portion.

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**3,673,364**

**TRANSFORMER SLIDE SWITCH WITH CONTACT CLAMPING MEANS**

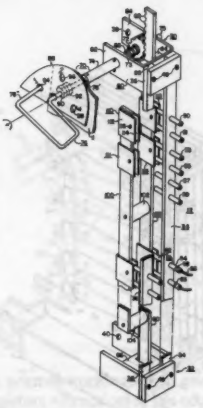
**Kenneth R. Klein, Niles, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Nov. 13, 1970, Ser. No. 89,397**

**Int. Cl. H01h** *15/08, 1/56*

**U.S. Cl. 200—16 C** **5 Claims**

An electrical series-multiple switch adapted for mounting within the casing of an electrical transformer, and actuable from without the casing. The switch, which may be used for single or polyphase applications, includes at least one cooperative pair of insulating shaft members, which carry a plurality of complementary electrical contacts spaced across the longitudinal dimensions of the shaft members. One of the pair of insulating shaft members is movable rectilinearly, rela-



tive to the other, in response to rotary movement of an operating shaft, which changes the relationship of the electrical contacts and the operating position of the switch.

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**3,673,365**

**SLIDE KEY SWITCH WITH IMPROVED PLUNGER ACTUATING MECHANISM WITH LOST MOTION COUPLING**

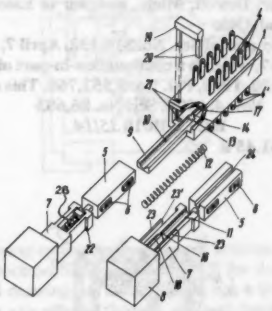
**Rudolf Schadow, Konigsbacher Zeile 23, 1000 Berlin 28, Germany**

**Filed Dec. 18, 1970, Ser. No. 99,377**

**Claims priority, application Germany, May 6, 1970, P 20 23 109.8**

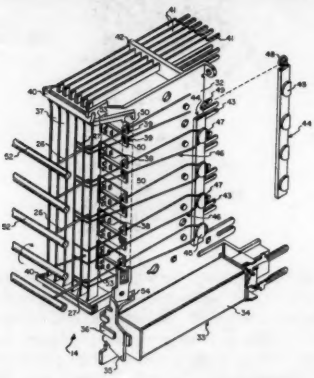
**Int. Cl. H01h** *15/24*

**U.S. Cl. 200—16 R** **10 Claims**



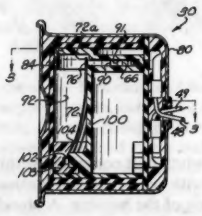
A slide key switch unit contained within a housing having a front opening with an extending portion, extending beyond the front opening of the housing. A plurality of electrical contacts are formed in the housing and a helical adjusting spring is disposed in the extending portion and urged against a key actuating plunger which is also slidably disposed in the front opening of the housing and engaging the extending portion.

3,673,366
CROSSBAR SWITCH
Clifford Edward Symes, Galion, Ohio, assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed May 10, 1971, Ser. No. 141,876
Int. Cl. H01h 9/00
U.S. Cl. 200—175 7 Claims



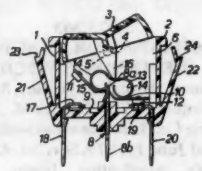
A crossbar switch is shown which utilizes a plurality of select units and a plurality of hold unit assemblies mounted on a frame. All of the armatures for the select units are located on one end of the crossbar switch frame, and a plurality of select-off-normal switches are positioned on the opposite end. Each hold unit is composed of a hold armature assembly, a plurality of fixed contacts, a plurality of movable contacts under the control of movable cards and a plurality of select fingers, which in conjunction with the hold armature, translate the selected cards to close the movable contacts which are under the control of the selected card. There is also provided a select finger holder having a plurality of mounting posts which frictionally engage the support member of the hold unit, said holder further including a plurality of mounting buttons for receiving and supporting the select fingers.

3,673,367
CRASH SENSOR
Hermann Kaiser, Detroit, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Continuation-in-part of Ser. No. 814,132, April 7, 1969, Pat. No. 3,618,117, which is a continuation-in-part of Ser. No. 753,948, Aug. 20, 1968, Pat. No. 3,552,768. This application Nov. 4, 1970, Ser. No. 86,683
Int. Cl. H01h 35/14
U.S. Cl. 200—61.45 R 8 Claims



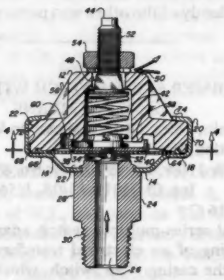
An improved sensor assembly for actuating a vehicle safety apparatus upon the occurrence of an accident includes a mass which is movable from an initial position to an actuated position in response to the occurrence of an accident. When the mass is in its actuated position, the safety apparatus is activated to protect the occupant of the vehicle. A plurality of spring contact fingers bias the mass toward its initial position. Cam means is associated with the contact fingers and act to apply a preload to the mass. As the mass moves toward its actuated position, the number of spring fingers which cooperate to bias the mass decreases and the biasing force exerted by the remaining spring fingers increases. Thus, the mass moves from its initial position to its actuated position against a biasing force which may be controlled by the configuration of the spring fingers and the cam member.

3,673,368
ELECTRICAL SWITCH
John Arthur Howe, Tollerton, and Leslie Oliver Bryan, Stapleford, both of England, assignors to TRW Inc., Cleveland, Ohio
Filed Jan. 18, 1971, Ser. No. 107,375
Int. Cl. H01h 13/28
U.S. Cl. 200—67 G 5 Claims



The invention comprises a snap-over switch comprising a casing housing in which is mounted a rocker arm carrying spaced movable contacts respectively engageable with a respective fixed contact on rocking movement of the arm by a pivoted switch actuator member through the intermediary of a leaf spring located on the rocker arm, the spring being shaped to provide a central portion in superposed spaced relation to the rocker arm and engageable by the switch actuator member and a looped portion at each end respectively engaging portions of the rocker arm extending from opposite sides of the support about which the arm pivots.

3,673,369
DIAPHRAGM PRESSURE SWITCH WITH INTEGRAL STOP MEANS FOR DIAPHRAGM SEALING
Frank C. Weaver, Chicago, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.
Filed Nov. 25, 1970, Ser. No. 92,558
Int. Cl. H01h 35/34
U.S. Cl. 200—83 B 2 Claims



A diaphragm pressure actuated switch comprising two housings sandwiching the diaphragm therebetween. Integral

circumferentially spaced stops with a length less than the diaphragm thickness project from one housing, and extend through the diaphragm into contact with the other housing, thereby preventing fracture of the diaphragm upon the application of excessive clamping forces.

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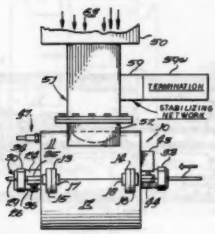
**3,673,370**

## MICROWAVE APPLICATOR SYSTEM WITH CYLINDRICAL RESONANT CAVITY

**Ray M. Johnson, Danville, Calif., assignor to Cryodry Corporation, San Ramon, Calif.**

**Filed April 3, 1970, Ser. No. 25,402**
**Int. Cl. H05b 9/06**
**U.S. Cl. 219—10.55** **17 Claims**




A cylindrical microwave resonant cavity is excited in the $TM_{010}$ mode to generate an electric field extending parallel to the axis of the cavity and having a maximum intensity along the axis. A filament or thread is conveyed axially through the cavity and heated. The cavity housing is formed into two sections along radial planes. The sections are hinged about a line parallel to the axis to facilitate opening the housing and cleaning its interior. Liners may be provided to cover the interior of each section. A slot is formed between the sections opposite the hinge line for threading the filament into its operative axial position. Clamps are provided to resiliently urge the sections together, yet the clamps permit adjustment of the angle of inclination between the sections by means of a screw mechanism to tune the resonant frequency of the cavity to the operating frequency of the microwave source. Air, preheated by cooling the source, is routed through the feed guide into the cavity to purge vapors from the cavity and prevent accumulation of residue. An electrical interlock is provided to inhibit operation of the microwave source when the sections are separated beyond a predetermined limit.

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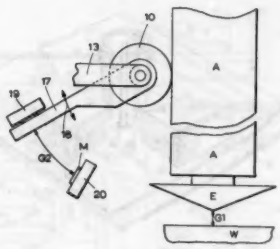
**3,673,371**

## GAP MONITORING ELECTRIC-DISCHARGE-MACHINING APPARATUS

**Gordon Victor Smith, and Eric John Ward, both of Gloucester, England, assignors to Sparcatron Limited, Gloucester, England**

**Filed March 26, 1971, Ser. No. 128,405**
**Claims priority, application Great Britain, April 14, 1970, 17,764/70**
**Int. Cl. B23p 1/14**
**U.S. Cl. 219—69 G** **6 Claims**

The invention provides electrical discharge machining apparatus including in combination, a gap monitoring circuit registering machining energy flow across a working gap between a tool electrode and a workpiece in terms of voltage and/or current; a servo system which effects advance and retraction of the tool electrode to maintain the working gap within predetermined dimensions; a retraction detection means registering the extent of retraction of the tool electrode. In addition there is provided a subsidiary control circuit which is effective to operate at least one of (i) a warning device which may be visible or audible, (ii) means for disconnecting the supply of machining power to the inter-electrode gap, (iii) means for fully retracting the tool electrode; this subsidiary circuit being effective only when the following conditions exist simultaneously: the gap monitoring circuit registers machining energy flow at normal working levels and the retraction detection means registers retraction of the tool electrode to such an extent that the tool electrode and the workpiece are separated by more than a predetermined distance.

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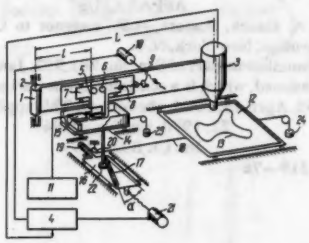
**3,673,372**

## COPYING SYSTEM FOR CUTTING OUT ARTICLES OF COMPLEX SHAPE BY THE ELECTROEROSION METHOD

**Viktor Jurievich Veroman, ulitsa Soldata korzuna, 3, kv. 159; Vladimir Alexeevich Rozanov, Tikhoretsy prospekt, 9, korpus 8, kv. 74, and Mikhail Yakovlevich Rabinovich, ulitsa Rustaveli, 18, kv. 40, all of Leningrad, U.S.S.R.**

**Filed June 7, 1971, Ser. No. 150,397**
**Int. Cl. B23p 1/12**
**U.S. Cl. 219—69 V** **1 Claim**

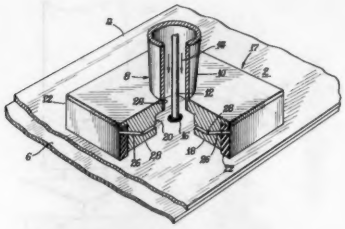


A copying system for cutting out articles of complex shape by the electroerosion method, which for the purpose of using enlarged drawings as master-forms has a traverse that swings about an axis passing through one end thereof, and carries an electrode-tool, its other end carrying a pickup, the traverse being swung by one of the drives of the tracing system. The copying system also has a supplementary carriage moved by the second drive of the tracing system, and connected to the board of the master-form by means of a flexible tie, while its connection with the carriage whereon secured is the working table, is realized through a sine converter disposed on said supplementary carriage and capable of regulating its angle of inclination.

## 3,673,373
## WELD SUPPORT FOR WELDING APPARATUS

Donald S. Lovett, Charleroi, Pa., assignor to McGraw-Edison, Elgin, Ill.

Filed Feb. 10, 1971, Ser. No. 114,301
Int. Cl. B23k 9/16
U.S. Cl. 219—74 5 Claims

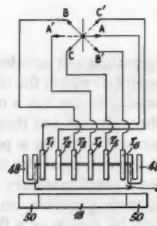


A weld support for a gas shielded metal arc welding apparatus is disclosed as having a welding block provided with a relatively flat surface, a resilient rubber strip around the periphery of the flat surface, a welding chamber within the block and a plurality of gas exhaust passages connecting the welding chamber and the exterior of the block and having bends intermediate their extremities. A shielding chamber is affixed to the welding block around an opening into the welding chamber for receiving and holding a nozzle of the welding apparatus perpendicular to the flat surface of the welding block and enclosing shielding gas fed through the nozzle into the welding chamber. When a weld is being made, the welding block is held against the material being welded to maintain the welding apparatus perpendicular to the material. The rubber strip assists in maintaining this perpendicularity by accommodating any irregularities in the surface of the material. The rubber strip also prevents flow of molten weld material away from the vicinity of the weld spot. The bend in the gas exhaust passages prevent weld spatter from escaping from the welding chamber.

## 3,673,374
## SURFACE METAL WELDING PROCESS AND APPARATUS

Clifford A. Hauck, Somers, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 701,932, Jan. 31, 1968, abandoned, which is a continuation-in-part of Ser. No. 359,952, April 15, 1964, abandoned. This application April 22, 1970, Ser. No. 30,947
Int. Cl. B23k 9/04
U.S. Cl. 219—76 8 Claims



Material is melted in the surface of a metal body by maintaining a plurality of 300 to 10,000 ampere electric arcs, each energizing between an electrode surrounded by a gas cup or nozzle and such surface. The nozzles are positioned about ¼ to about 1 gas cup diameter from the surface. The arcs are swept across the work by self-induced electro-magnetic interaction while providing relative motion between the surface and the arcs. The speed of such motion is correlated with the current of such arcs.

## 3,673,375
## LONG ARC COLUMN PLASMA GENERATOR AND METHOD

Salvador L. Camacho, Raleigh, N.C., assignor to Technology Application Services Corporation, Raleigh, N.C.

Filed July 26, 1971, Ser. No. 165,941
Int. Cl. B23k 9/00
U.S. Cl. 219—121 P 4 Claims

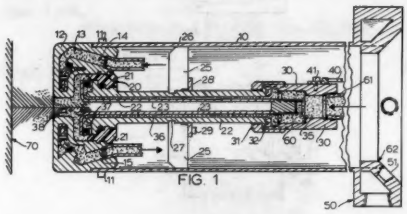


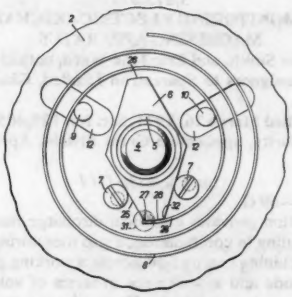
FIG. 1

A long arc column plasma generator and method provide a means and method for initiating and sustaining an exceptionally long transferred arc. The improved vortex strength, mass flow rate and radial pressure gradient are obtained by a new relationship between the nozzle length, the nozzle diameter, and the vortex chamber width.

## 3,673,376
## METHOD FOR ATTACHING THE INNER END OF A BALANCE SPRING TO ITS COLLET

Jean-Claude Kullmann, Rue de la Ruche 39, La Chaux-de-Fonds, Canton, Neuchatel, Switzerland

Filed Aug. 19, 1969, Ser. No. 851,315
Claims priority, application Switzerland, Aug. 26, 1968, 12748/68; Feb. 10, 1969, 2005/69
Int. Cl. B23k 9/00
U.S. Cl. 219—121 LM 10 Claims

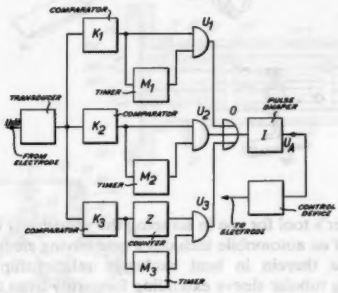


The balance spring and the collet are held in precise positions on a work table so that the upper edge of the inner end of the spring is flush with an upper face of the collet and at least sufficiently near to the latter to enable a laser beam aimed at this zone to weld together the collet and the spring.

## 3,673,377
## APPARATUS AND METHOD FOR CONTROLLING OR MONITORING ELECTRIC WELDING PROCESSES

Friedrich Erdmann-Jesnitzer, Hannover-Linden, and Dietrich Rehfeldt, Hannover-Vinnhorst, both of Germany, assignors to Redemat S.A., Luxembourg-Ville, Luxembourg

Filed Sept. 18, 1969, Ser. No. 859,021
Claims priority, application Germany, Nov. 2, 1968, P 18 06 648.3
Int. Cl. B23k *9/10*
U.S. Cl. 219—131 R 2 Claims

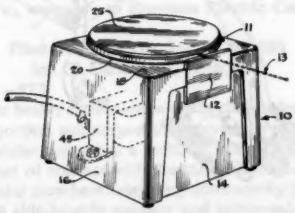



A method and apparatus for controlling or monitoring electric arc welding processes by analyzing an input signal derived from a welding parameter by means of a transducer. This input signal is analyzed with respect to its amplitude, duration and occurrence frequency during a preselected period and an error signal is generated to indicate the error or defect at the seam which is welded and to drive the welding apparatus toward the correct adjustment.

## 3,673,378
## ARCH WIRE ANNEALER

Peter C. Kesling, Green Acres, La Porte, Ind.

Filed Feb. 1, 1971, Ser. No. 111,194
Int. Cl. C21d *9/62*
U.S. Cl. 219—156 1 Claim

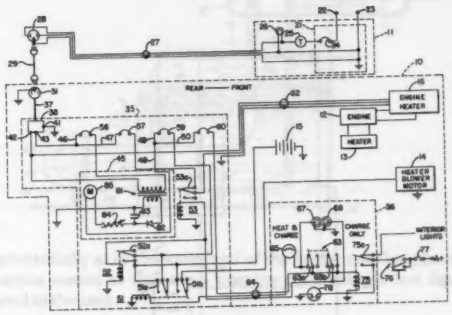



A device for annealing end portions of wire, including first and second contact members between which the wire is placed and to which electrical power is provided, wherein the wire completes the circuit, and wherein the contact members are such that varying lengths of wire can be annealed, and wherein one contact member is movable to present another portion thereof in association with the other contact member.

## 3,673,379
## MOTOR VEHICLE WARM-UP AND BATTERY CHARGER SYSTEM

Richard F. Eversull, 5009 Ogallala Place, Cheyenne, Wyo.

Filed March 20, 1970, Ser. No. 21,382
Int. Cl. B60l *1/02*
U.S. Cl. 219—202 2 Claims

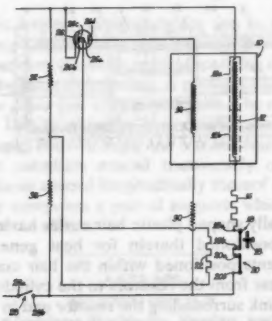



A utility system for motor vehicles can be energized by remote control and is especially useful in cold weather for charging a battery and heating the engine and interior of the vehicle without starting the engine. A battery charger furnishes the necessary DC power and is connected to simultaneously charge the vehicle battery and run the blower while the engine heater is on; or, in the alternative, will only charge the battery in response to the setting of a selector switch in the vehicle. Preferably, a cable carries AC power from a building to the vehicle and a switch at the building turns the system on and off. A alarm is activated if entry is made into the vehicle without disconnecting the power cable which is plugged into the vehicle.

## 3,673,380
## GLOW SWITCH RELAY FOR BLANKET OVERHEAT CONTROL SWITCH

George C. Crowley, Winnetka, Ill., assignor to Northern Electric Company, Chicago, Ill.

Filed Oct. 26, 1971, Ser. No. 192,090
Int. Cl. H01h *37/00*
U.S. Cl. 219—212 4 Claims

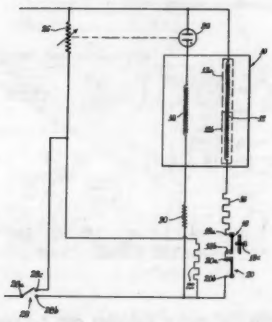


An overload protection circuit for an electric heating blanket is provided. A sensing element in the blanket is coupled to a gas filled tube which has a pair of contacts that are opened when an overload condition is sensed, causing a bimetallic element to open a second pair of contacts connected in series with the heating element.

## 3,673,381
## THERMOSTATLESS BLANKET CONTROL CIRCUIT

George C. Crowley, Winnetka, and Gordon S. Carlson, Northbrook, both of Ill., assignors to Northern Electric Company, Chicago, Ill.

Filed Oct. 26, 1971, Ser. No. 192,181
Int. Cl. H01h 37/00
U.S. Cl. 219—212 6 Claims

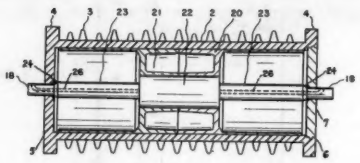


An overload protection circuit for an electric heating blanket is provided. A sensing element in the blanket is coupled to a neon-filled diode. When an overload condition is sensed the diode ceases to emit light and a bimetallic element in series with a light-responsive resistor causes a pair of contacts in series with the heating element to open.

## 3,673,382
## ELECTRICALLY HEATED HAIR CURLER

Francis J. Gaffney, East Norwalk, Conn.; Joseph F. Degen, Rockville, and Gerald F. Clark, Thurmont, both of Md., assignors to North American Philips Corporation, New York, N.Y.

Filed Dec. 9, 1969, Ser. No. 883,418
Int. Cl. A45d 2/36; H05b 1/00
U.S. Cl. 219—222 4 Claims

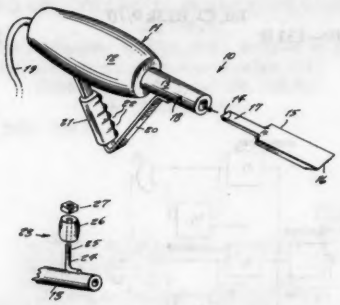


A cylindrically shaped plastic hair curler having an electrical resistor positioned therein for heat generation. Heat transfer elements positioned within the hair curler for conducting the heat from the resistors to the cylindrical walls include a heat-sink surrounding the resistor and in contact with and conforming to the inner surface of the plastic hair curler. The heat-sink is formed of two shell members having aligned, inwardly projecting cavities for housing the electrical resistor. The resistors may also be supported on a spool member which will support the heat transfer members which surround and are in contact with the resistors. A shell heat-sink member may then surround the heat transfer members to carry the heat of the resistors to the outer wall of the curler.

## 3,673,383
## ELECTRICALLY HEATED SCRAPING TOOL

George V. Sofia, 2202 E. 8th St., Brooklyn, N.Y.

Filed Sept. 15, 1970, Ser. No. 72,253
Int. Cl. A47l 13/02; H05b 1/00; B26b 3/00
U.S. Cl. 219—227 2 Claims

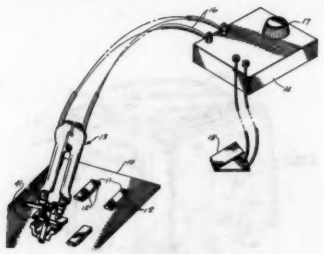


A glazier's tool for use in scraping the windshield retaining channel of an automobile includes a case having electric heating means therein in heat exchange relationship with a protruding tubular sleeve extending forwardly from the case. A steel chisel is removably received in the sleeve. A V-shaped support bracket is secured to the bottom of the casing and sleeve for supporting the chisel at a correct angle with respect to the surface being scraped. The rear leg of the bracket is provided with a heat insulating hand grip. An upwardly extending heat insulating hand grip may also be provided on the sleeve if desired.

## 3,673,384
## INTEGRATED CIRCUIT EXTRACTOR TOOL

Per Aron Burman, Temple City, and Harold E. Drew, Arcadia, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 2, 1970, Ser. No. 86,061
Int. Cl. H05b 1/00; B25b 7/02; B23k 3/00
U.S. Cl. 219—230 16 Claims



A hand tool is described for removing integrated circuit components or the like from printed circuit boards. The tool has a plierlike action for bringing a pair of heated jaws each provided with a flat electric resistance heater against the component leads for melting the solder attaching the component to the board. An adjustable stop prevents the heated jaws from contact and damaging the board. A pair of pincer jaws are mounted on one of the heated jaws so as to be movable in a direction transverse to the direction of movement of the heated jaws. Cams on the pincer jaws are actuated by the other heated jaw to close the pincer jaw in response to closure

of the heated jaws. The pincer jaws have a turned end for gripping beneath a component for lifting the component after the solder is melted.

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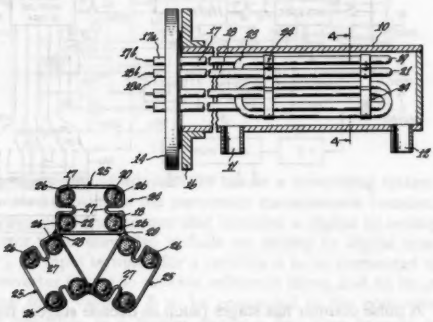
**3,673,385**
**ELECTRIC HEATING ASSEMBLY**

**Lester D. Drugmand, and Sidney J. Temple, both of Pittsburgh, Pa., assignors to Emerson Electric Co., St. Louis, Mo.**

**Filed Dec. 4, 1970, Ser. No. 95,250**
**Int. Cl. H05b *3/02*; F24h *1/10***
**U.S. Cl. 219—335** **7 Claims**



A heating assembly of the type wherein a plurality of metal sheathed electric heating elements are arranged in a cluster, each having one end connected to a flange member, the elements being elongated and cantileverly extending from the flange member, and means for holding end portions of said heating elements in predetermined laterally spaced relation, comprising a sheet metal band for each heating element having sockets for receiving and holding the end portions, the sheet metal bands being connnected together.

In a preferred form, the sheet metal band is of rectilinear formation with socket portions formed at the four corners to receive respective ends of the legs of a heating element. The sheet metal bands are connected to each other so that their socket portions hold the pairs of legs of all elements in spaced relation.

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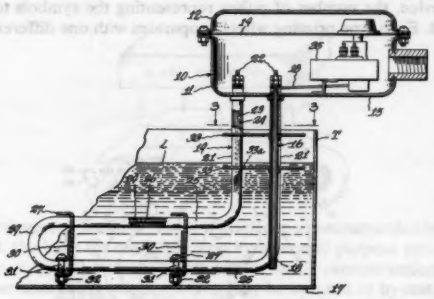
**3,673,386**
**ELECTRIC IMMERSION HEATERS**

**Lester D. Drugmand, and Sidney J. Temple, both of Pittsburgh, Pa., assignors to Emerson Electric Co., St. Louis, Mo.**

**Filed Oct. 19, 1970, Ser. No. 82,003**
**Int. Cl. H05b *3/06*; F24h *1/02***
**U.S. Cl. 219—523** **4 Claims**

An electric heater construction particularly adapted to have its heating portion submerged in a substance contained in a tank. The heater comprises a terminal box which is disposed above and out of contact with the tank substance and a plurality of tubular members extending downwardly from the terminal box in side-by-side manner and immersed in the tank substance, one of said tubular members being adapted to contain a thermal element influenced by the thermal conditions of the tank substance, and the other tubular members containing electric heating elements for heating the tank substance. The tubular elements are held in predetermined side-by-side relationship by a plate which has openings to pass the respective tubular elements, said one tubular element being fixed in its plate opening and the other tubular elements freely passing through their plate openings, whereby to hold the tubular members in predetermined side-by-side relationship while permitting relative longitudinal movement thereof. A conventional sheathed electric heater of hairpin formation may be used for the heating elements, the terminal pins defining cold heater lengths and the plate is fixed to the one tubular element



substantially at to the lower end of the heater cold lengths and carries means to indicate a warning concerning a low liquid level in the tank.

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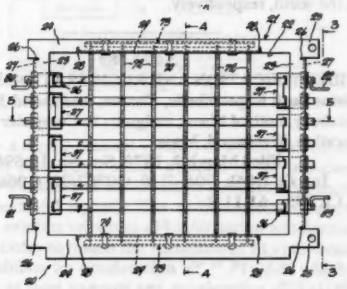
**3,673,387**
**ELECTRIC HEATERS**

**Lester D. Drugmand, and John F. Volker, both of Pittsburgh, Pa., assignors to Emerson Electric Co., St. Louis, Mo.**

**Filed Feb. 22, 1971, Ser. No. 117,361**
**Int. Cl. H05b *3/06***
**U.S. Cl. 219—532** **6 Claims**



An electric heater, particularly for use in a xerographic system, having a frame defining a rectangular opening, and a plurality of reaches of ribbon resistor spanning one pair of opposed walls defining the opening. A plurality of support members span the other pair of opposed walls. The resistor ribbon is extremely thin to generate heat quickly when an electric current is passed therethrough, and is transversely corrugated. The support members extend transversely of the ribbon reaches at places spaced longitudinally thereof and each support member comprises a pair of supports which engage opposite sides of the ribbon.

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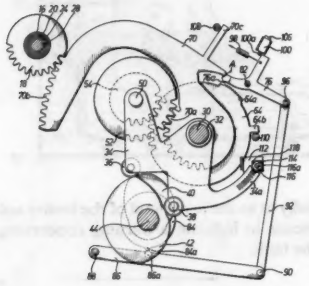
**3,673,388**
**SETTING DEVICE**

**Claes-Goran Lindelow, Stockholm, Sweden, assignor to Svenska Dataregister AB**

**Filed Sept. 24, 1970, Ser. No. 75,010**
**Claims priority, application Sweden, Oct. 1, 1969, 13486/69**
**Int. Cl. G06k *3/00***
**U.S. Cl. 235—92 R** **8 Claims**

A setting device, the preferred embodiment having, type printing wheels settable to different positions by electric pul-

ses including a pulse producing device emitting pulses to a counting machine which emits a pulse to at least one of a plurality of solenoids, each one representing one order, and energizes the solenoids when the machine has received a predetermined number of pulses from the pulse producing device, the number of pulses representing the symbols to be set. Each type printing wheel cooperates with one differential



arrangement for each order which also includes one rotatable gear provided with teeth, one of which, via an intermediate coupling device, is engaged by the solenoid when energized, to be stopped in a position corresponding to the symbol to be set. Two driving rotatable gears of the differential arrangement rotate the type printing wheel and the rotatable gear provided with the teeth, respectively.

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**3,673,389**

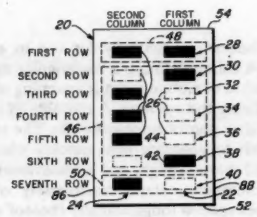
## IDENTIFICATION AND REGISTRATION SYSTEM

**Christos Basil Kapsambelis, Canton, and David Janett Collins, Duxbury, both of Mass., assignors to Computer Identics Corporation, Westwood, Mass.**

**Filed March 2, 1970, Ser. No. 15,596**

**Int. Cl. G06k 7/08, 7/10; G07f 7/02; G06k 19/06**

**U.S. Cl. 235—61.11 R** **10 Claims**




A medium and a system for reading information arrayed in a plurality of sets on the medium, each of the sets including a plurality of items arranged to form a plurality of subsets of items, each subset including an item from at least one of the sets, the items being binary representations having either a first or a second state including means for simultaneously scanning each of the subsets, means for generating an input signal each time a subset is scanned and storage means for receiving an item of information from each set each successive scan of a subset.

**3,673,390**

## PULSE COUNTERS

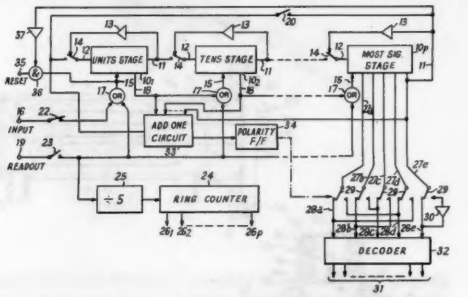
**Peter Eric Krebs, Farnborough, England, assignor to The Solartron Electronic Group Limited, Farnborough, England**

**Filed Nov. 16, 1970, Ser. No. 89,581**

**Claims priority, application Great Britain, Dec. 1, 1969, 58,624/69**

**Int. Cl. H03k 21/16, 27/00**

**U.S. Cl. 235—92 SH** **7 Claims**




A pulse counter has stages (such as decade stages) formed from binary circuits and preferably each based on a shift register. In the invention the binary circuits are reconnected in one large shift register whereby the digits can be shifted through the register to pass through one stage in turn, whereat they are read out in turn.

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**3,673,391**

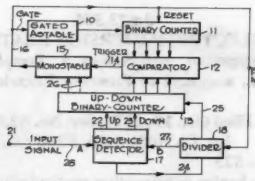
## DIGITAL FREQUENCY MULTIPLYING SYSTEM

**James H. Lougheed, Ottawa, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada**

**Filed Dec. 16, 1970, Ser. No. 98,505**

**Int. Cl. H03k 5/00; G01r 23/02**

**U.S. Cl. 235—150.3** **7 Claims**



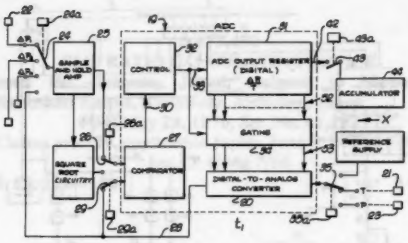

A frequency multiplier in which an output pulse train is obtained, at a frequency related to the frequency of a sequence of input pulses. A counter is connected to a fixed oscillator and an output pulse generated each time the count reaches the same number as that stored in a separate up-down counter. The output frequency is controlled by varying the number stored in the up-down counter. This control is obtained by applying the output pulse train to a dividing circuit, which sets the overall multiplying factor of the system, and comparing the time of occurrence of the output pulses from the dividing circuit and the input pulses to the system to provide an appropriate change in the number stored in the up-down counter.

## 3,673,392

### REMOTE TERMINAL COMPUTING UNIT TO COMPUTE B/A × C VALUES, FOR USE BY CENTRAL COMPUTER

Wayne E. Holm, Costa Mesa, Calif., assignor to Hydril Company, Los Angeles, Calif.

Filed Feb. 2, 1970, Ser. No. 7,818
Int. Cl. G06j *1/00*
U.S. Cl. 235—150.5 17 Claims



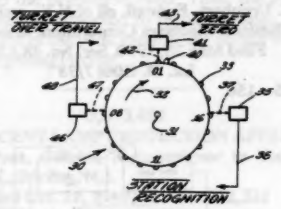

A computing unit adapted for use in a computing system, but located proximate the parameter measurement location, comprises converter means that includes a digital to analog converter (and may also include an analog to digital converter); an input terminal for a variable A to be connected to the converter means to provide reference input, and an input terminal for a variable B to be connected to the converter means operating as a divider during a first time interval to produce an output representative of the quantity B/A; and an input terminal for a variable C to be connected to the digital to analog converter operating as a multiplier during a second time interval to produce an output representative of the quantity B/A × C.

## 3,673,393

### TURRET INDEXING CONTROL CIRCUIT

Thomas G. Schober, West Seneca, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Sept. 30, 1969, Ser. No. 862,383
Int. Cl. G06f *15/46*
U.S. Cl. 235—151.1 4 Claims




A turret indexing system for machine tools having a position counter for representing turret position, with a predetermined coded signal being operable to automatically index the turret to an initial position and to insert a corresponding initial count in the position counter at start up.

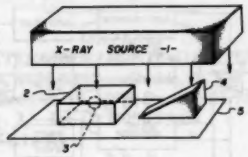
## 3,673,394

### MEASURING METHOD AND APPARATUS

Frederick Hartmann, Rolling Hills Estates, Calif., assignor to North American Rockwell Corporation

Filed Feb. 18, 1969, Ser. No. 800,179
Int. Cl. G01n *23/04*
U.S. Cl. 235—151.3 17 Claims

Measurement of the shape, location, and density of a hidden object is provided by passing energy such as X-rays through the object in two mutually angulated directions and measuring the changes in energy. The measured changes in the two directions are then combined to reconstruct the shape of the hidden object. Details of a number of reconstruction techniques are set forth. There is disclosed a reconstruction by hand; the basis for reconstruction by a general purpose computer; a special purpose computer for shape reconstruction; and an alternative solution which may be by hand or by computer.

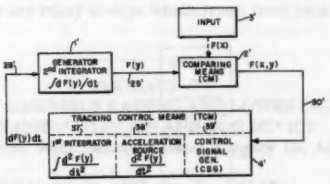



## 3,673,395

### HIGH SPEED DIGITAL TRACKING SYSTEM

Robert W. Tripp, Tuckahoe, N.Y., assignor to Inductosyn Corporation

Filed Feb. 5, 1971, Ser. No. 112,993
Int. Cl. H03k *25/04*; G01b *7/02*
U.S. Cl. 235—151.11 23 Claims




Disclosed is a digital readout system, in which a to-be-measured function F(*x*) (e.g., space position of an Inductosyn transducer) is tracked and measured by a measuring function F(*y*) (e.g., electrical signal). The to-be-measured function F(*x*) typically exhibits velocities $dF(x)/dt$ and/or accelerations $d^2F(x)/dt^2$. In order to match the variations of $F(y)$ to those of $F(x)$, $F(y)$ exhibits an acceleration $d^{pr\ of}\ F(y)/dt^2$ which by system design at least exceeds any acceleration $d^2F(x)/dt^2$ of $F(x)$ which is to be encountered. The measuring function $F(y)$ is then derived by two controlled integrations of $d^2F(y)/dt^2$. The first integration, controlled by the error signal from an Inductosyn transducer, produces the velocity $dF(y)/dt$ of $F(y)$. The second integration, controlled by the sign of the velocity $dF(y)$/produces $F(y)$ itself. $F(y)$ tracks and is an accurate measure of $F(x)$. Additionally, the velocity $dF(x)/dt$ of $F(x)$ is tracked by the velocity $dF(y)/dt$ of $F(y)$. A second order servo system is produced in which both the velocity and position of the measuring function $F(y)$ track the velocity and position of the to-be-measured function $F(x)$.

## 3,673,396

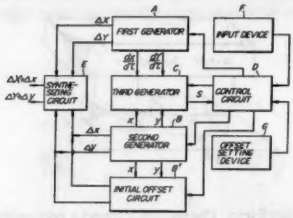
### NUMERICALLY CONTROLLED CONTOURING SYSTEM

Susumu Seki, Kokubunji-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 440,187, March 16, 1965, abandoned. This application Dec. 30, 1968, Ser. No. 787,951
Claims priority, application Japan, March 16, 1964, 39/14378
Int. Cl. G05b *19/24*
U.S. Cl. 235—151.11 1 Claim

Numerically controlled contouring system wherein original command pulses (ΔX, ΔY) and offset pulses (Δx, Δy) are

synthesized so as to obtain offset command pulses ($\Delta X + \Delta x$, $\Delta Y + \Delta y$) for following the offset curve at a desired offset distance away from an original curve $X(\tau)$, $Y(\tau)$ and an operation for producing said offset command pulses is con-




trolled so that the inner product of the tangential direction ($dX/d\tau$, $dY/d\tau$) of the original curve and a variable ($x$, $y$) varying along the circumference of a circle having a radius equal to the offset distance and a center lying on the original curve, is made zero.

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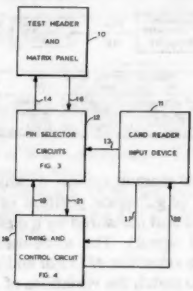
**3,673,397**

## CIRCUIT TESTER

**Bruce M. Schaefer, Santa Clara, Calif., assignor to The Singer Company, New York, N.Y.**

**Filed Oct. 2, 1970, Ser. No. 77,478**
**Int. Cl. G06f 9/04, 15/20**
**U.S. Cl. 235—153** **5 Claims**



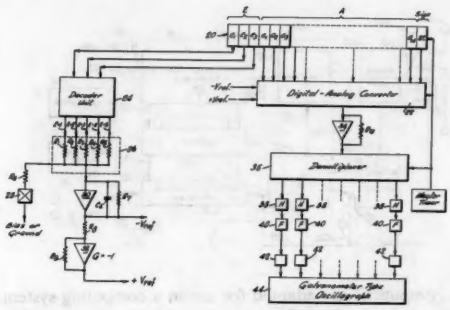

The disclosed embodiment of the present invention is an automatic circuit tester for providing stimuli to, sensing responses from, and sensing the condition of individual input and output terminals of the circuit under test. Identical circuit means are provided for each input and output terminal of the circuit under test, and each includes a storage device for storing a prediction of the expected response of the stimulus to be applied to a corresponding input terminal of the circuit under test. Each of the circuit means also includes a logic circuit for comparing the prediction of the expected response and producing a "fail" signal upon the occurrence of non-coincidence therebetween. Each of the circuit means are automatically provided with data corresponding to the prediction of the expected response or the stimulus to be applied to the circuit under test from a programmable record such as a data processing card. In addition, each circuit means is capable of responding to or providing stimulus in the proper form to the corresponding terminal in accordance with the type of logic employed in the circuit under test. This is accomplished by employing translators for converting input and output signals to appropriate signals which are compatible with the type of logic employed in the circuit means and in the circuit under test. Each circuit means is programmed by programable data processing cards and the information programmed on such cards is strobed by appropriate timing and encoding circuits into a corresponding one of the circuit means.

**3,673,398**

## SEISMIC PLAYBACK SYSTEM

**Robert J. Loffbourrow, Houston, Tex., assignor to Texaco Inc., New York, N.Y.**

**Continuation of Ser. No. 842,477, July 17, 1969, abandoned. This application June 30, 1971, Ser. No. 158,582**
**Int. Cl. H03k 13/00**
**U.S. Cl. 235—154** **8 Claims**




Hereinafter disclosed is methodology and apparatus for converting wide dynamic amplitude range digital data recorded in floating point digital word form, comprising a binary coded mantissa and a binary coded exponent, to an analog signal or visible display, such as an oscillogram of selectively compressed dynamic amplitude range. The digital word occupying a number of binary bit positions is, in algebraic form, $\pm AG^{-E}$; wherein A represents the mantissa or argument, G represents the base or radix of the number system used and E represents the exponent. Since the base G is constant (at for example 8) the only binary bits that need to be recorded are those representing the mantissa A and the exponent E. In reconverting the digital data to analog form for making an oscillogram, wiggle trace or other visible display, the invention contemplates selectively compressing the dynamic amplitude range of the analog signals and at the same time avoiding the introduction of serious distortions.

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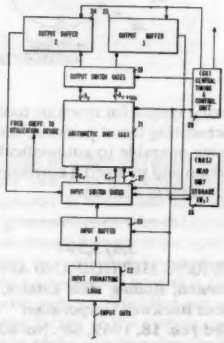
**3,673,399**

## FFT PROCESSOR WITH UNIQUE ADDRESSING

**Peter J. Hancke, Apalachin; Monroe Judkovics, Endicott, and Robert J. Urquhart, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed May 28, 1970, Ser. No. 48,624**
**Int. Cl. G06f 7/38**
**U.S. Cl. 235—156** **21 Claims**




A real time digital Fourier analyzer using the Cooley-Tukey algorithm for calculating the Fast Fourier Transform. An

arithmetic unit simultaneously performs the two complex calculations $A_r = B_r + W_r C_r$ and $A_{r+n/2} = B_r - W_r C_r$. The calculated results are simultaneously stored and retrieved in an in-place operation in dual buffers in successive iterations. Addressing of the buffers uses a single binary address counter and sequential bit complementing for simultaneously addressing both buffers. Parity checking of the binary counter output address controls multiplexing logic to selectively address the buffers to store the calculated results into the desired buffer storage locations.

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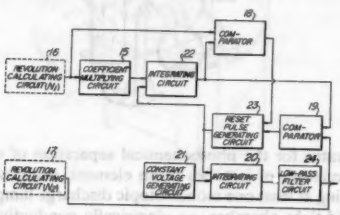
**3,673,400**

**SLIP RATIO CALCULATING DEVICE**

**Osamu Ito, Tokyota, Japan, assignor to Nippondenso Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan**

**Filed May 28, 1970, Ser. No. 41,293**
**Claims priority, application Japan, June 9, 1969, 44/45200**
**Int. Cl. G06g 7/16**
**U.S. Cl. 235—196** **3 Claims**




A slip ratio calculating device for calculating a slip ratio, i.e., the ratio of two revolutions are prepared, one of the voltage signals is multiplied by one n-th in a coefficient multiplying circuit. This coefficient-multiplied output is integrated in a first integrating circuit and then compared with the other of said voltage signals in a comparator. This comparator generates an output when the two input signals become equal. The resultant output works to reset the integrating circuit through a reset pulse generating circuit. The first integrating circuit renews integration upon disappearance of a reset pulse. There is provided a second integrating circuit which integrates the output of a constant voltage generating circuit and is reset by said reset pulse. The peak value of the integrated voltage is proportional to the revolution ratio. Thus, the ratio of two revolutions which is subjected to restless change can be obtained in the form of the peak value of the output voltage from the second integrating circuit.

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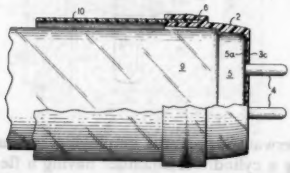
**3,673,401**

**FLUORESCENT LAMP PROTECTION APPARATUS**

**Paul R. Du Pont, Gillette, N.J., assignor to Thermoplastic Processes Inc., Stirling, N.J.**

**Filed Oct. 29, 1969, Ser. No. 872,321**
**Int. Cl. H05b 33/04**
**U.S. Cl. 240—11.4** **4 Claims**



A fluorescent lamp jacket assembly is disclosed employing an expansible or dilatable plastic jacket which substantially encloses the entire length of the glass envelope of a fluorescent lamp and is held to the lamp by means of a pair of plastic end caps so that rupturing of the glass lamp envelope will not be accompanied by bursting or separation of the jacket or its end caps, thereby containing all the debris ensuing from the implosion reaction accompanying breaking of the fluorescent lamp.

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**3,673,402**

**EXTENDIBLE LIGHTING FIXTURE**

**Harvey I. Weiss, 8837 Kastner, Skokie, Ill.**

**Filed Oct. 19, 1970, Ser. No. 81,746**
**Int. Cl. H05b 33/00**
**U.S. Cl. 240—51.11 R** **14 Claims**

A flourescent lighting fixture housing is manufactured in a compact size and shape. While in this compact size, the fixture is shipped, warehoused, and otherwise manipulated prior to installation. To facilitate further manipulation during the actual installation itself, it is possible to mount the fixture while in its compact condition, and to thereafter extend it to its full length. There are many savings which result from such a fixture.

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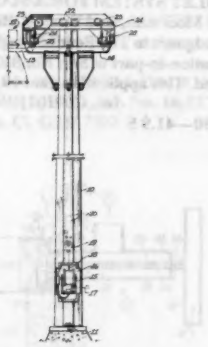
**3,673,403**

**LIGHT ASSEMBLY RAISING AND LOWERING MECHANISM WITH PIN AND DOG DEVICE**

**Roger P. Woods, 5607 Lakeview Drive, Calgary 10, Alberta, Canada**

**Filed March 24, 1971, Ser. No. 127,687**
**Int. Cl. F21v 21/14, 21/36**
**U.S. Cl. 240—64** **4 Claims**



A raising and lowering mechanism for a light assembly in a high mast lighting structure includes a light assembly supporting ring encircling a hollow pole on which the light assembly is mounted. The ring has a fixed operating position at the top of the pole. A winch with flexible line means is employed to impart travelling movement to the ring and light assembly up and down the pole. Flexible line branches are connected to the ring at diametrically opposite points. A pair of upright pins are fixedly mounted on the ring and each pin cooperates with a pair of pivoting dogs mounted in the housing to define the

fixed operating position and to release the ring and light assembly from such position by suitable operation of the winch.

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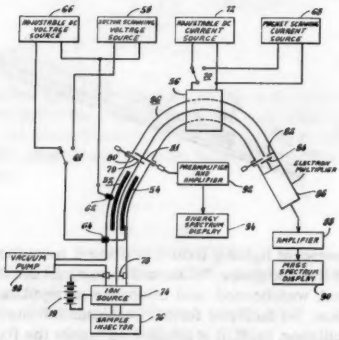
3,673,404

## ION KINETIC ENERGY ANALYSIS

Harold W. Major, Jr., Trumbull, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 15, 1970, Ser. No. 37,565
Int. Cl. B01d 59/44
U.S. Cl. 250—41.9 ME 1 Claim




A method of ion kinetic energy analysis is provided by forming ions including metastable ions from a vaporized sample material, accelerating the ions toward a target collector electrode through an electric field, and for an interval of time for enhancing the probability of decomposition of the metastable ions in an area along a trajectory of the ions intermediate the ion source and the electric field, varying the electric field intensity for causing daughter ions of differing kinetic energy to be successively focused at a point along the trajectory and providing a spectrum display of the intensity of the ions formed at the point in synchronism with the field variation.

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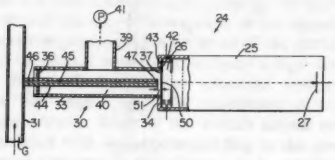
3,673,405

## GAS INLET SYSTEM FOR A MASS SPECTROMETER

Charles J. Moorman, and Fred A. Reuter, both of Cincinnati, Ohio, assignors to The Bendix Corporation

Continuation-in-part of Ser. No. 812,582, March 28, 1969, abandoned. This application Jan. 14, 1971, Ser. No. 106,576
Int. Cl. H01j 39/34
U.S. Cl. 250—41.9 S 11 Claims



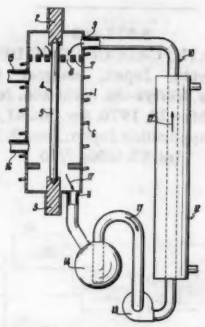

A mass spectrometer having an improved inlet system which assures that there is a minimum time lag, generally of the order of milliseconds, between changes in the composition of a material being analyzed and the analysis of corresponding changes in the associated spectra. The inlet system includes a primary leak directly opposite and closely spaced to a secondary leak leading into an ionization chamber so that changes in the composition of a gas leaving the primary leak are more rapidly communicated to the ionization chamfer for faster analysis by the mass spectrometer.

3,673,406

## ISOTOPE SEPARATION APPARATUS

Guy Nief, Paris, and Jean-Pierre Morand, Arceuil, both of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed July 18, 1969, Ser. No. 843,058
Int. Cl. G01n 21/26; G01j 3/42
U.S. Cl. 250—43 8 Claims



Apparatus for the photochemical separation of an isotope from a mixture of isotopes of an element, such as mercury, comprising at least one monoisotopic discharge lamp mounted in a fluid-tight chamber, an electrically conductive winding exciting the discharge lamp, means for circulating a liquid non-oxidizable and unreactive with the element through the chamber to continuously flush the walls of the chamber and the lamp, and an inlet and outlet in the chamber for introducing and exhausting a gaseous mixture containing the element and at least one substance which reacts with the isotope to be separated.

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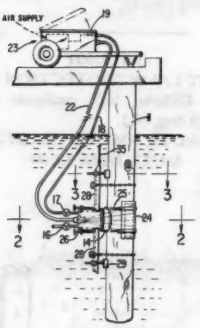
3,673,407

## RADIOGRAPHIC APPARATUS FOR UNDERWATER INSPECTION OF WOODEN PILINGS

George C. Wiswell, Jr., 1014 Pequot Road, Southport, Conn.

Filed Feb. 19, 1969, Ser. No. 800,432
Int. Cl. H01j 37/20
U.S. Cl. 250—52 3 Claims




An underwater apparatus employing radioactive material comprising a cylindrical chamber having a flexible end wall with the chamber being mounted against an underwater object through which the radiant energy rays are to be passed for radiographic purposes so that the flexible wall conforms to the surface of the object. A film pack is retained on the other side

of the object opposite the flexible wall, and water is evacuated from the chamber. A source of radiation is positioned through a flexible conduit into the closed chamber opposite the flexible wall. The chamber has an inlet valve connected to a source of air under pressure and an exhaust valve.

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**3,673,408**

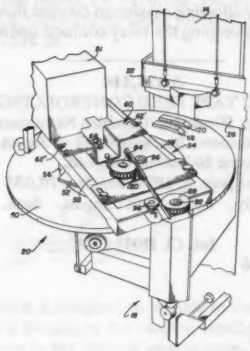
**COMBINATION RADIOGRAPHIC APPARATUS**

**Merton Moss, 6701 N. Keeler, Lincolnwood, Ill.**

**Filed April 27, 1970, Ser. No. 32,217**

**Int. Cl. G03b *41/16***

**U.S. Cl. 250—61.5** **26 Claims**



A combination radiographic apparatus for taking panoramic, intra oral, occlusal and cephalometric and other types of radiographs of the head, jawbone and teeth, said apparatus comprising a rotating anode tube X-ray source, a film holder assembly and means for interchanging the pivot point of rotation relative to the subject being X-rayed. Pivot shifting means are also provided for shifting the pivot point by shifting the apparatus relative to the subject; the subject remaining stationary or shifting a free standing or sitting subject to predetermined positions with the apparatus remaining stationary. The X-ray source and film holder assembly are disposed opposite each other, the subject matter to be X-rayed being placed directly in line between the source and the film.

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**3,673,409**

**IRRADIATION APPARATUS FOR PROVIDING A HIGH INITIAL IRRADIATION OF THE PRODUCT**

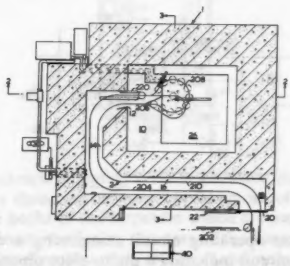
**William R. Green, Ottawa, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada**

**Filed March 27, 1970, Ser. No. 23,273**

**Claims priority, application Canada, Feb. 6, 1970, 074167**

**Int. Cl. G21h *5/00***

**U.S. Cl. 250—106 R** **6 Claims**



There is disclosed apparatus for the radioactive irradiation of products whose composition requires a relatively high intensity of irradiation for a short period followed by a relatively low intensity of irradiation for a longer period. In order to efficiently utilize the source, the product is passed into the center of a rack of source material and thereafter passed around the outside of the rack. The product is cooled by water during irradiation and the same water is used to effect rotation of the product.

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**3,673,410**

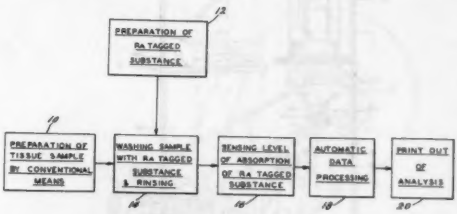
**METHOD OF EXAMINATION OF CELL SAMPLES USING A RADIOACTIVELY TAGGED DYE**

**John H. Waite, 46 Grove St., Haddonfield, N.J., and John H. Nodine, 523 Richards Road, Wayne, Pa.**

**Continuation-in-part of Ser. Nos. 836,439, June 25, 1969, abandoned, and Ser. No. 24,441, April 30, 1970, abandoned. This application June 9, 1970, Ser. No. 44,818**

**Int. Cl. G21h *5/02*; G01t *1/20***

**U.S. Cl. 250—106 T** **26 Claims**




A sample of cells from a body under investigation is treated with a radioactively tagged substance which is determined to be selectively absorbed by one or more predetermined cell types sought to be identified either as disease producing cells or abnormal cells of the body and distinguished from other cell types. The radioactively tagged substance is aborbed in different amounts by some cells and rejected by other cells. After treatment and washing, the level of radioactivity of the cell sample is sensed in order to determine from the degree of absorption of the radioactively tagged substance information about the presence of absence of disease. The technique may be applied to mass screening for disease of a particular type or types by collecting and identifying similar samples from many subjects and using a predetermined common standard of radiation level to eliminate those samples which are clearly free from disease.

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**3,673,411**

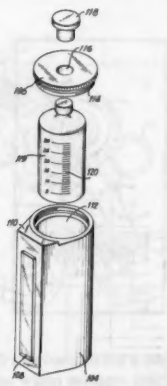
**HOLDER FOR RADIOACTIVE MATERIAL**

**Herman Glasser, New Hyde Park, N.Y., assignor to Nuclear Associates, Inc., Westbury, N.Y.**

**Continuation-in-part of Ser. No. 782,311, Dec. 9, 1968. This application March 3, 1970, Ser. No. 16,017**

**Int. Cl. G21f *7/02***

**U.S. Cl. 250—108 R** **7 Claims**



Holder for radioactive material fabricated of high density material to reduce transmission of energy, either by radiation

or particle bombardment, either inwardly or outwardly thereof while yet enabling observation of material within an inner container or vial.

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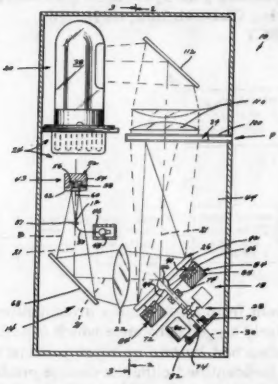
**3,673,412**

## RADIANT ENERGY BEAM SCANNING METHOD AND APPARATUS

**Gaylor G. Olson, Inglewood, Calif., assignor to TRW Inc., Redondo Beach, Calif.**

**Filed March 2, 1970, Ser. No. 15,372**
**Int. Cl. G01j *1/20*; G11b *7/08***
**U.S. Cl. 250—201** **8 Claims**



A radiant energy beam scanning method and apparatus having means for projecting a beam of radiant energy toward and bringing the beam to focus within a scanning plane, scanning means for deflecting the beam laterally to cause scanning motion of the beam along a prescribed scan track within the scanning plane, and servo means for sensing lateral departure of the beam from the scan track, generating tracking error signals related to the direction of such departure, and controlling the scanning means in response to the tracking signals to maintain the beam on the scan track. A recording and playback method and apparatus embodying the scanning apparatus for recording a data track on a record and subsequently playing back the data track.

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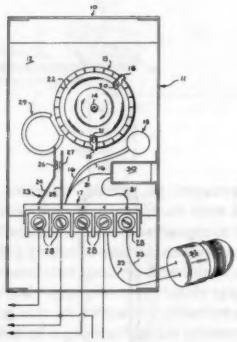
**3,673,413**

## TIME AND LIGHT CONTROLLED SWITCHING CIRCUIT

**Art Lee, El Passo, Ill., assignor to General Electric Company**

**Filed Aug. 28, 1970, Ser. No. 67,899**
**Int. Cl. G09f *11/10*; H01h *47/24*; H05b *37/02***
**U.S. Cl. 250—206** **7 Claims**



A control system comprising a device for turning ON and OFF a motor at set times each day, for turning ON lights during the ON period of the motor upon the onset of darkness, and for turning the lights OFF at the same time as the motor, the device including a timer and its contacts, a relay, a filter capacitor, a resistor, diode, and a photocell, the latter being mounted remotely, the motor of the timer and a series combination of the photocell and relay coil being connected across line voltage in parallel, the contacts of the timer for a predetermined period of time each day connecting line voltage to the rotator motor load and to the normally closed contacts of the photocell controlled relay which are held open during the day, the contacts of the timer also supplying electrical power to the lighting circuits when the relay is de-energized, and the normally closed relay contacts being open during the daylight hours when the resistance of the photocell is minimum thereby allowing maximum current flow to energize the relay coil thus keeping the relay contacts open.

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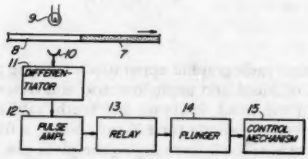
**3,673,414**

## AUTOMATIC TAPE FEED CONTROLLING MEANS

**Hiroshi Taniguchi, Hirakata; Takahiro Nakamura, Neyagawa, and Hideki Sakumoto, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd.**

**Filed Sept. 8, 1970, Ser. No. 70,035**
**Claims priority, application Japan, Sept. 18, 1969, 44/75589**
**Int. Cl. H01j *39/12***
**U.S. Cl. 250—206** **4 Claims**




The prescribed position along the running direction of the tape is detected and taken out as an electric signal. The unidirectional component of the differentiated output of the detected electric signal is taken out for controlling the tape driving system to feed or stop the tape in a steady condition.

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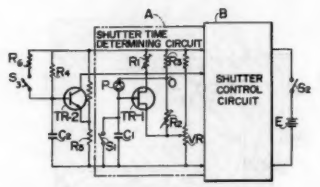
**3,673,415**

## SHUTTER OPERATING CIRCUIT HAVING MEANS TO CLOSE SHUTTER WHEN LIGHT IS INSUFFICIENT

**Hirofumi Yoshimura, Okaya and Hisatoshi Takahata, Shimosuwa-Machi, both of Japan, assignors to Yashica Company Limited, Tokyo, Japan**

**Filed Nov. 4, 1970, Ser. No. 86,653**
**Claims priority, application Japan, Nov. 8, 1969, 44/105631**
**Int. Cl. G01j *1/00*; H01j *39/12***
**U.S. Cl. 250—214 P** **4 Claims**




In a shutter operating circuit comprising a shutter time determining circuit including a photo-electromotive element, and a high input impedance transistor; means to initiate the operation of the shutter time determining circuit; a shutter control circuit controlled by the shutter time determining circuit; and a source of supply connected to said two circuits, there are provided a series circuit connected across the source

and including serially connected resistor and capacitor, and a switching transistor with its base electrode connected to the juncture between the resistor and the capacitor, the series circuit acting to trigger the switching transistor to operate the shutter control circuit when the shutter time determining circuit fails to operate after elapse of a predetermined interval after the operation of the initiating means.

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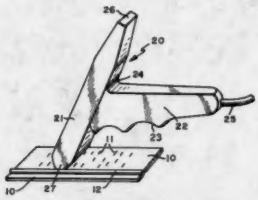
**3,673,416**

## HAND HELD PHOTO-OPTICAL READER FOR PRINTED DOCUMENTS

Robert M. Berler, Westport, Conn., assignor to Pitney Bowes-Alpex, Inc., Danbury, Conn.

Filed March 19, 1970, Ser. No. 21,139
Int. Cl. G01n *21/30*; G06k *7/00*; H01j *39/12*
U.S. Cl. 250—219 DC 5 Claims



A reader which is designed to be held in the hand and to be scanned over a document for reading intelligence contained on the document in the form of printed code. The reader contains no moving parts and comprises essentially a housing with a reading aperture through which the printed matter is exposed, a photo electric cell array to sense the coded print, and a lens positioned so as to focus the printed information obtained through the aperture onto the photocell array; a light source whose direct light is shielded from the photocells is positioned contiguous to the aperture to shed light on the printed matter to be read.

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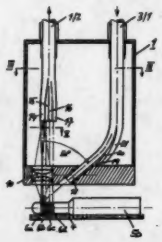
**3,673,417**

## PHOTOELECTRIC SCANNING APPARATUS FOR DETECTING CODE MARKINGS

Robert Wahli, Unterengstringen, Switzerland, assignor to Ciba-Geigy AG

Filed Aug. 7, 1970, Ser. No. 62,088
Claims priority, application Switzerland, Aug. 12, 1969, 12217/69
Int. Cl. G08c *9/06*
U.S. Cl. 250—219 D 4 Claims



A photoelectric scanning head is provided for identifying ampoules by detecting different combinations of color-coded rings on the necks of the ampoules which are moved past the head in a direction aligning the axes of the ampoules at right angles to their direction of travel. The head includes a plurality of first optical systems having lenses arranged in a staggered relationship in relation to the direction of travel of the ampoules, the lenses imaging light from the code rings via associated optical fibers to a photosensitive device which provides signals corresponding to the coding provided by said rings to identify the ampoule being scanned. The rings are illuminated by a plurality of second optical systems which comprise a bundle of optical fibers which guide separate beams of light from a source onto the rings as they are being scanned. The ends of the optical fibers of the second optical systems are positioned in the head in the same staggered relationship as the lenses of the first optical systems.

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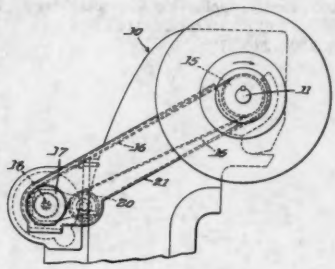
**3,673,418**

## AUTOMATIC REGISTERING APPARATUS

Chester M. Wilg, Lincolnwood, Ill., assignor to F. J. Littell Machine Company, Chicago, Ill.

Filed Sept. 14, 1970, Ser. No. 71,994
Int. Cl. G01n *21/30*
U.S. Cl. 250—219 DR 5 Claims



The strip material which is fed intermittently in desired feed lengths is provided with register marks at feed length intervals and photoelectric means continuously scan the strip to detect the marks and effect adjustment of the feed rolls either forwardly or rearwardly through the brake mechanism so as obtain the desired accurate registration of the marks. The photoelectric means produce electric signals as the marks are scanned and said electric signals are passed by shutter means only in the event the mark is detected in either the lead or in the lag zones. The electric signals thus passed are caused to produce electric pulses which are delivered to an electric motor having driving relation with the brake mechanism.

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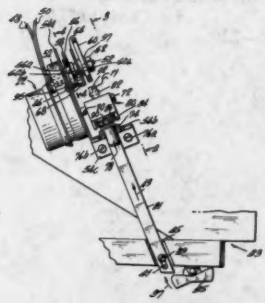
**3,673,419**

## AUTOMATIC SHUT-OFF MECHANISM FOR COPYING MACHINE

Torulf Aasen, Hollywood, Fla., assignor to Copystatics Manufacturing Corporation, Miami Lakes, Fla.

Filed March 16, 1970, Ser. No. 19,994
Int. Cl. G06m *7/00*
U.S. Cl. 250—222 R 6 Claims



An automatic shut-off mechanism for a copying machine. A timing motor determines when no new original document to be copied has been fed into the machine for 60 seconds. At the completion of the timing cycle, an auxiliary contact in the

main power line is opened. In order to close this contact, the main on-off switch on the front panel of the machine must first be turned off, the auxiliary contact being closed at this time by a mechanical linkage to the main switch. Whenever a new document to be copied is fed into the machine during the running of the timing motor, the motor resets to the "zero" time position and the timing cycle begins once again.

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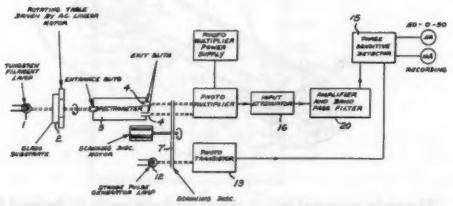
**3,673,420**

## THICKNESS CONTROL SYSTEM FOR MULTI-LAYER OPTICAL THIN FILM WORK

**John Ward, Elizabeth Park, and Ross Paterson, Vale Park, both of Australia, assignors to The Commonwealth of Australia care of The Secretary of Supply, Parkes, Canberra, Australia**

**Filed May 8, 1969, Ser. No. 823,013**
**Claims priority, application Australia, May 10, 1968, 37631**
**Int. Cl. G01n *21/30***
**U.S. Cl. 250—219 TH** **8 Claims**




A method and apparatus for controlling the thickness of multi-layer optical thin film work by balancing light from each side of a particular wavelength through a chopper which alternately passes the light to filtering and detecting means so arranged that when a quarter wavelength or a multiple thereof has been deposited a balanced reading will be restored, a strobe pulse variable in time in relation to the processed waveform being used to select a reference point which will give enhanced accuracy of deposition control.

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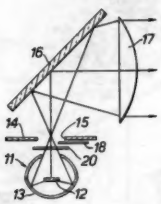
**3,673,421**

## LIGHTING SYSTEMS FOR ROAD VEHICLES

**Harris Vernon Hicks, Lichfield Staffs, and Kenneth James Jones, Sutton Coldfield, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England**

**Continuation-in-part of Ser. No. 734,300, June 4, 1968, which is a continuation-in-part of Ser. No. 485,788, Sept. 8, 1965, abandoned. This application Feb. 12, 1969, Ser. No. 798,744**
**Claims priority, application Great Britain, Oct. 1, 1968, 46,450/68The portion of the term of this patent subsequent to Dec. 23, 1986, has been disclaimed.**
**Int. Cl. G01d *5/34***
**U.S. Cl. 250—229** **6 Claims**




1. A lighting system for a road vehicle, comprising in combination a light source and associated lens for producing a beam of light illuminating the road in front of the vehicle, a mask having therein an aperture, focusing means associated with the light source and arranged so that an image of the light source appears in the aperture, and a well defined image of the aperture is projected forwardly to constitute said beam, a shutter movable from a rest position across the aperture, and means sensitive to light received from an oncoming vehicle for progressively moving the shutter across the aperture so as to cut off sufficient of the beam to avoid dazzling the driver of the oncoming vehicle.

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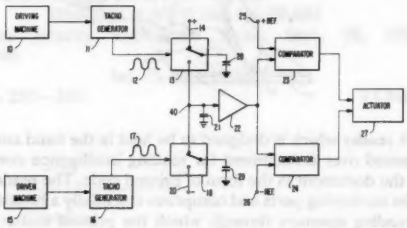
**3,673,422**

## LOSS OF SYNCHRONISM DETECTOR

**Harry G. Parke, Brooklyn, N.Y., assignor to Galbraith-Pilot Marine Corporation, Brooklyn, N.Y.**

**Filed Jan. 18, 1971, Ser. No. 107,283**
**Int. Cl. H02j *1/00***
**U.S. Cl. 307—87** **13 Claims**




A driving machine and a driven machine are to be kept in synchronism. Tachometer generators attached to both machines generate signals which charge a capacitor either positively or negatively with respect to a given reference, and should the charge on this capacitor increase above a certain level, a circuit breaker means opens the line connecting the armatures of the two machines.

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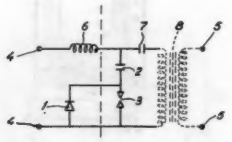
**3,673,423**

## ELECTRONIC HIGH FREQUENCY PULSE GENERATOR

**Luis Valls Planas, Barcelona, Spain, assignor to Neutra Cuatro S.A., Barcelona, Spain**

**Filed Oct. 19, 1970, Ser. No. 82,054**
**Claims priority, application Spain, Oct. 17, 1969, 373222**
**Int. Cl. H03k *3/00***
**U.S. Cl. 307—107** **4 Claims**

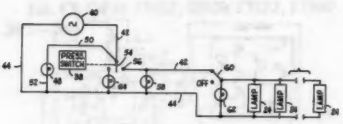



An electronic high frequency pulse generator, connected to the A.C. feed mains, constituted essentially by a voltage limiter, a diode and a capacitor arranged in such a way that alternate half-cycles of the alternating feed current produce a high frequency pulse usable in a plurality of industrial processes.

## 3,673,424
## PRESSURIZED LIGHTING SYSTEM

Graydon A. Phlieger, Jr., Cocoa, Fla., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Feb. 12, 1971, Ser. No. 114,849
Int. Cl. H01h 35/18
U.S. Cl. 307—118 3 Claims

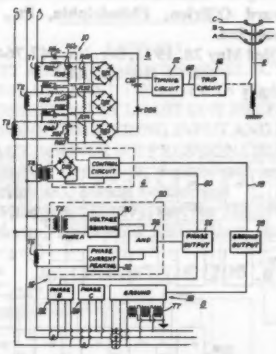


A safety lighting system for a chain of lamps, each of which is housed within a hermetically sealed translucent tubular housing member. A control box is provided for supplying electrical power to the lamps in the lighting assemblies. A pressurized source of inert gas is fed through the control box at a predetermined pressure and through each of the sealed translucent tubular housing members. A pressure sensitive switch is provided in the control box for disconnecting the electrical power to the lamps when the pressure of the inert gas within any of the translucent tubular housing members drop below a predetermined level.

## 3,673,425
## DIRECTIONAL CURRENT RELAY

Michael J. Plichta, Milwaukee, Wis., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Sept. 1, 1971, Ser. No. 176,912
Int. Cl. H02h 3/18
U.S. Cl. 307—127 14 Claims

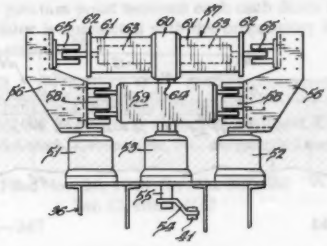


A current direction indicator including control means for performing a predetermined operation in a poly-phase electrical power system independently of the magnitude of current flow in the polyphase system. A separate current direction indicating circuit is provided for each phase and includes a first circuit for producing a signal in response to a change in polarity of current in one of the phases of the system, a second circuit for producing a signal functionally related to the polarity of the voltage between two of the phases of the system and a third circuit which produces an output signal when both signals of the first and second circuits occur simultaneously. The control means operates in response to the output signal to initiate the predetermined operation in the system.

## 3,673,426
## PHASE REVERSAL SWITCH AND/OR CIRCUIT BREAKER

Donald E. Weston, East Sebago, Maine, and Raymond F. Kupetis, Chicago, Ill., assignors to H. K. Porter Company, Inc., Chicago, Ill.

Filed March 31, 1970, Ser. No. 24,079
Int. Cl. H01h 35/00
U.S. Cl. 307—127 11 Claims



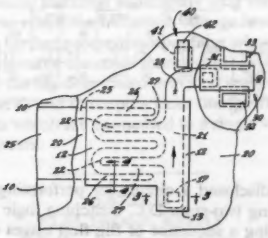
Apparatus for selectively connecting a rotary electric machine to an electric power distribution system for use as a generator supplying power to the system or as a motor drawing power from the system, comprising in a three phase system, a switch for the common phase, a pair of switches for each of the other two phases, and interphase means coupling one switch of each of said pairs to the opposite of said two phases, whereby machine phases A, B and C may be connected to system phases A, B and C respectively, or system phases A, B and C may be connected to machine phases B, A and C respectively; and for other phase reversing service.

Also, improved switch construction for performing the above and other functions.

## 3,673,427
## INPUT CIRCUIT STRUCTURE FOR MOS INTEGRATED CIRCUITS

Michael R. McCoy, and Glen E. Nixon, both of San Jose, Calif., assignors to Electronic Arrays, Inc., Mountain View, Calif.

Filed Feb. 2, 1970, Ser. No. 7,768
Int. Cl. H011 19/00
U.S. Cl. 307—202 6 Claims

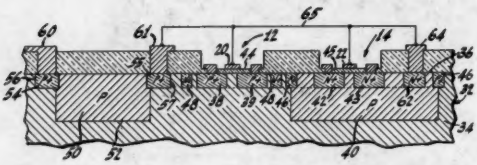


An MOS integrated circuit has input circuit bonding pads individually used as gate in a protective transistor, having channel width larger than the linear dimensions of a pad, and having turn-on voltage above normal input signal levels. The transistor switches into the circuit attenuating resistance, and a zener diode is shunted parallel to the input signal path in the interior of the IC-chip.

## 3,673,428
## INPUT TRANSIENT PROTECTION FOR COMPLEMENTARY INSULATED GATE FIELD EFFECT TRANSISTOR INTEGRATED CIRCUIT DEVICE

Terry George Athanas, Lebanon, N.J., assignor to RCA Corporation

Filed Sept. 18, 1970, Ser. No. 73,343
Int. Cl. H01l *19/00*
U.S. Cl. 307—202 9 Claims

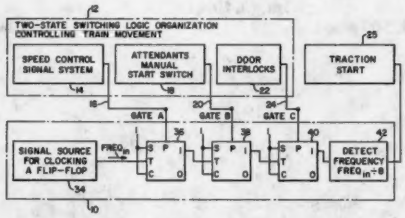


In a CMOS integrated circuit of the type which includes a diffused P type region in which the N type transistors are formed, a resistor-region is provided by diffusion at the same time as that P type region. A diode having low breakdown is established by forming P+ type regions or N+ type regions in electrical communication with the resistor so that the diode breakdown is effectively dominated by the impurity concentration characteristics of the P+ type or N+ type regions.

## 3,673,429
## PSEUDO-AND GATE HAVING FAILSAFE QUALITIES

Robert H. Perry, Monroeville, and Thomas C. Matty, Belle Vernon, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 789,536, Jan. 7, 1969, abandoned.
This application Oct. 19, 1970, Ser. No. 82,101
Int. Cl. H03k *19/22*
U.S. Cl. 307—218 9 Claims

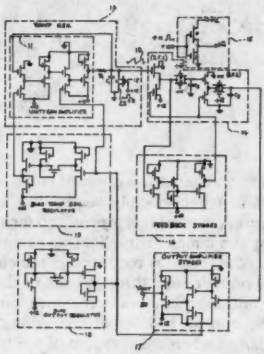



There is disclosed a circuit for performing an AND gate function using two-state D.C. switching logic as the gate inputs, including a sequence of flip-flop stages connected as a pulse frequency dividing network. Each flip-flop stage of the network is individually actuated into its operative role in the divider network by application of one of the logic signal inputs thereto as the stage operating potential. Simultaneous presence of TRUE logic conditions are sensed by application of a pulsing signal of predetermined frequency to the input of the dividing network and detection of the divided frequency at its output. Failure of any component or combination of components of this circuitry produces a no-output condition which is deemed failure in a failsafe manner.

## 3,673,430
## COS/MOS PHASE COMPARATOR FOR MONOLITHIC INTEGRATION

William J. Donoghue, Somerset, N.J., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Aug. 23, 1971, Ser. No. 173,896
Int. Cl. H03d *13/00*
U.S. Cl. 307—232 3 Claims

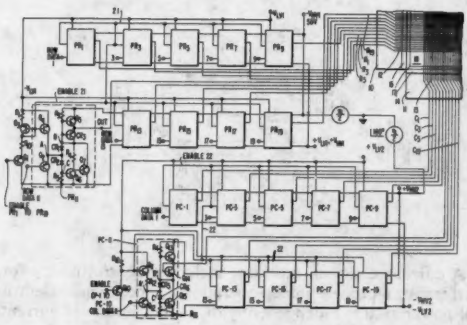


A phase comparator integrated circuit apparatus for comparing a pair of AC signals and providing a substantially pure DC output. The phase converter utilizes the time difference between pulses from two different input signals to provide a DC voltage which is free from AC ripple.

## 3,673,431
## LOW VOLTAGE PULSER CIRCUIT FOR DRIVING ROW-COLUMN CONDUCTOR ARRAYS OF A GAS DISCHARGE DISPLAY CAPABLE OF BEING MADE IN INTEGRATED CIRCUIT FORM

Thomas Edward O'Brien, Philadelphia, Pa., assignor to Owens-Illinois, Inc.

Filed May 28, 1971, Ser. No. 147,764
Int. Cl. H05b *41/00*
U.S. Cl. 307—241 3 Claims



There is disclosed an interfacing system for driving row-column conductor arrays to the gas discharge display panel in a low cost integrated circuit assembly. Due to the requirement of opposite polarity or bidirectional signals being applied to the conductors in the arrays, although the integrated circuits are functionally identical in translating low level logic signals to high voltage pulse signals which are algebraically added to sustainer voltages, the circuits are modified so as to permit

NPN PNP transistors to be formed on the same chip and thus simulate a power PNP transistor.

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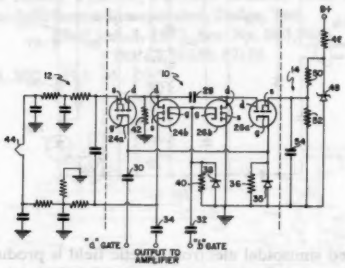
**3,673,432**

## DIFFERENTIAL VOLTAGE LEVEL DETECTOR WITH MICROVOLT SENSITIVITY

**Emile G. Smith, Bethel, and William L. Puskas, Trumbull, both of Conn., assignors to Avco Corporation, Stratford, Conn.**

**Filed July 28, 1971, Ser. No. 166,874**
**Int. Cl. G01r 17/02; H03k 17/22, 17/60**
**U.S. Cl. 307—246** **8 Claims**




An accurate overtemperature detector includes a system which enables the measurement of very low thermocouple voltages by detecting the difference between the thermocouple input signal voltage and an internally generated reference voltage. The detection is accomplished in a chopper-comparator which balances a millivolt thermocouple signal against an internally generated reference millivolt signal developed by a zener reference diode. In balancing the two voltage levels, one against the other, a chopped difference voltage is generated having a polarity and magnitude proportional to the difference. The difference voltage is then conditioned and applied to a decoder from which a control voltage is developed.

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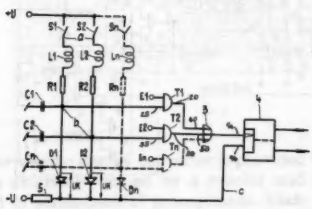
**3,673,433**

## CIRCUIT ARRANGEMENT FOR SELECTIVELY CONNECTING AT LEAST TWO INPUTS TO A COUNTING STAGE POSSESSING AT LEAST ONE PREPARATORY INPUT AND ONE TRIGGERING INPUT AND INCLUDING CONTACT BOUNCE SUPPRESSION CIRCUITRY

**Hanspeter Kupfer, Geroldswil, Switzerland, assignor to Albiswerk Zurich AG, Zurich, Switzerland**

**Filed July 26, 1971, Ser. No. 166,070**
**Claims priority, application Switzerland, Aug. 21, 1970, 12523/70**
**Int. Cl. H03k 17/28, 17/16**
**U.S. Cl. 307—247 A** **2 Claims**




A circuit arrangement for selectively connecting at least two inputs to a counting stage equipped with at least one preparatory input and one triggering input, wherein these inputs are connected in circuit with the triggering input of the counting stage through the agency of associated gates and a successively arranged common gate. A respective input of each associated gate is connected to a voltage via a respective switch controlling such gate. For the purpose of slowing down or retarding the switching-in signal flank there is connected in series with each switch an inductance coil and a damping resistor which collectively form in conjunction with a respective grounded capacitor an at least approximately critically damped series oscillating circuit. The junction point between each damping resistor and associated capacitor is connected via a diode and a common resistor to an oppositely poled voltage, and the junction point between each such diode and the common resistor is connected with the preparatory input of the counting stage.

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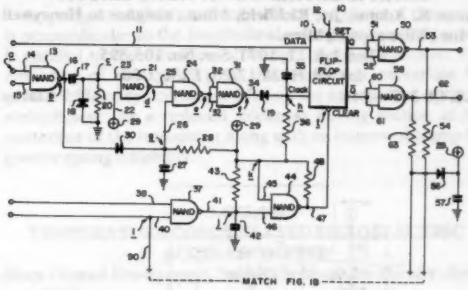
**3,673,434**

## NOISE IMMUNE FLIP-FLOP CIRCUIT ARRANGEMENT

**Michael D. McIntosh, Greencastle, Pa., assignor to Landis Tool Company**

**Filed Nov. 26, 1969, Ser. No. 880,080**
**Int. Cl. H03k 3/12**
**U.S. Cl. 307—247** **14 Claims**




A noise immune data processing flip-flop circuit arrangement is described in which the clock input for one or more transition triggered flip-flops is fed to the clock input terminal of respective flip-flops via a NAND circuit means which prevents the start of charging of a capacitor, across which triggering voltage is to appear, via a resistor until an input pulse fed to the NAND circuit appears which has at least a given duration thereby making the flip-flop immune to noise pulses of shorter duration. Additionally, the pulse for triggering must have a still greater duration sufficiently long enough to allow the capacitor to reach the transition voltage level for the flip-flop providing further protection from false triggering by noise pulses of still greater duration than the given duration. The clear input for the flip-flop is also provided with NAND circuit means, and the Q and Q̄ outputs from the flip-flop are fed to NAND circuits which are connected to a single voltage supply source via resistors.

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**3,673,435**

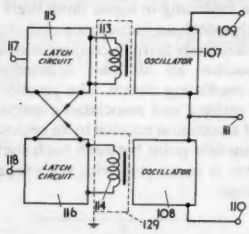
## ELECTRONIC RELAY

**Brian Stanley, Infinity, Knowle Gardens, Combe Martin, Devon, England**

**Filed March 17, 1970, Ser. No. 20,240**
**Claims priority, application Great Britain, March 18, 1969, 14,189/69**
**Int. Cl. H03k 17/74**
**U.S. Cl. 307—257** **10 Claims**

An electronic relay having two push-pull oscillators connected in series. Each oscillator has two transistors and a transformer having, in addition to its input and feedback

windings, a control winding. Each oscillator is controlled by a latch circuit which can prevent oscillation by connecting a low




resistor across the control winding. The latch circuits are interconnected so that only one oscillator can oscillate at any time.

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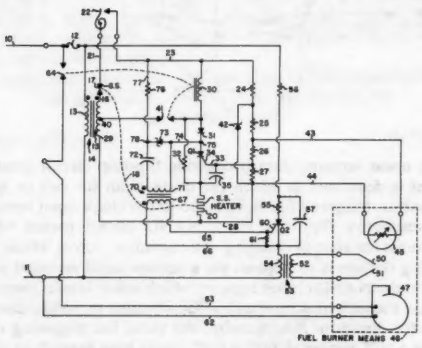
**3,673,436**

## LATE PHASE FIRING SWITCHING CIRCUIT

**James R. Adams, Jr., Richfield, Minn., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Jan. 11, 1971, Ser. No. 105,395**
**Int. Cl. H03k *17/28*; F23q *3/00***
**U.S. Cl. 307—246** **7 Claims**



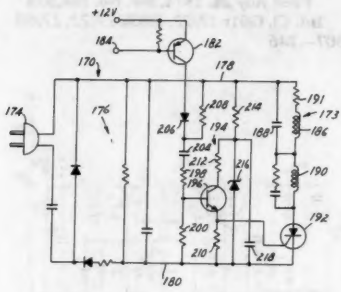

A control system is provided for energizing an electrical load, in the form of a spark ignition transformer, so that the load is energized for a portion of a half wave of the applied alternating current voltage. The control circuit utilizes a capacitor in series with the primary winding of a pulse transformer with this combination paralleled by a Zener diode for triggering a solid state switch such as a Triac or silicon controlled rectifier. The capacitor is charged through the pulse transformer primary by the applied alternating current voltage during the early or rising portion of the applied wave form causing a pulse of the wrong polarity to be applied to the gate of the silicon controlled rectifier until the Zener breakdown voltage is reached, at which voltage the capacitor is held charged. When the applied voltage declines to the Zener breakdown potential and the Zener causes to conduct, the capacitor is allowed to discharge through the pulse transformer primary causing a pulse of the proper polarity to trigger the solid state switch that in turn generates a spark through a step-up transformer.

**3,673,437**

## DAMPED SINUSOIDAL CURRENT PULSE GENERATOR AND METHOD

**Donald A. Wright, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.**

**Filed June 29, 1970, Ser. No. 50,840**
**Int. Cl. H03k *17/00***
**U.S. Cl. 307—252 J** **7 Claims**




A damped sinusoidal electromagnetic field is produced by oscillatory current flow in a conductor of an inductive component of an underdamped LC resonant circuit. Energy is stored in the resonant circuit when the resonant circuit is coupled to a steady state D.C. electrical energy source by the triggering into conduction of an SCR connected in series with the resonant circuit and the D.C. source. Energy is transferred to the resonant circuit by an inductor connected in series therewith. The inductance of the inductor is sufficiently less than that of the inductive component of the resonant circuit such that sufficient energy is stored in the resonant circuit at a sufficient rate to cause current flow in the SCR to ultimately cease. Thereupon the SCR shuts off the transfer of energy from the D.C. source to the resonant circuit, and damped sinusoidal oscillation occurs in the resonant circuit to produce a damped sinusoidal electromagnetic field. The SCR is intermittently triggered into conduction to produce an intermittent series of damped sinusoidal electromagnetic fields.

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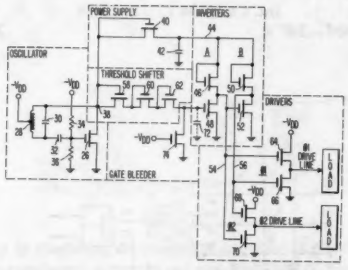
**3,673,438**

## MOS INTEGRATED CIRCUIT DRIVER SYSTEM

**George E. Lund, Berwyn, Pa., assignor to Burroughs Corporation, Detroit, Mich.**

**Filed Dec. 21, 1970, Ser. No. 100,065**
**Int. Cl. H03k *3/26***
**U.S. Cl. 307—270** **15 Claims**




An integrated circuit driver system utilizing Metal-Oxide-Silicon Field-Effect Transistors (MOS FET's) is disclosed for operation in a two-phase mode for driving a substantially capacitive load. A preferred embodiment of the invention makes use of an alternating current (ac) voltage having a

peak-to-peak magnitude somewhat greater than the direct current (dc) supply potential. An auxilliary dc power supply is implemented for converting the ac voltage to an operating potential for inverters which in turn provide the phase inverted signals required by a pair of drivers. The latter generate the alternate phases of the output voltage presented to the load. Additionally, the system exploits the MOS threshold voltage dropping properties to realize a threshold shift of suitable magnitude to insure the required duty cycle of the driver output pulse waveforms.

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**3,673,439**

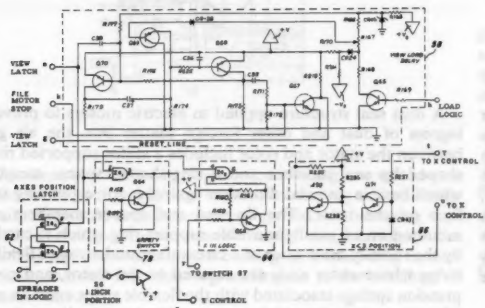
**RESETTABLE TIMING CIRCUIT**

**Samuel Reader Pearson, Farmers Branch, Tex., assignor to Texas Instrument Incorporated, Dallas, Tex.**

**Filed Jan. 5, 1971, Ser. No. 103,964**

**Int. Cl. H03k *17/26***

**U.S. Cl. 307—293** **1 Claim**




A timing circuit is disclosed wherein a single output pulse is generated after a preselectable delay. In response to a first programmed input, the output pulse occurs after a first delay, while control circuitry modifies the duration of the delay in response to a second programmed input. Generation of the output pulse automatically resets the timing circuit so that a new timing cycle may be initiated.

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**3,673,440**

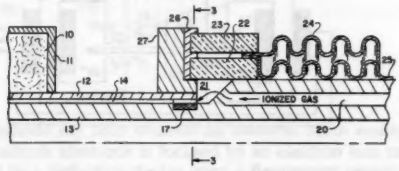
**UNINSULATED IN-CORE THERMIONIC DIODE**

**T. O. Paine, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Jerry P. Davis, La Canada, Calif.**

**Filed Oct. 15, 1968, Ser. No. 767,741**

**Int. Cl. H01j *45/00***

**U.S. Cl. 310—4** **5 Claims**




A thermionic energy converter is provided by a plurality of diodes externally heated by a reactor and externally connected in series-parallel arrangement. Each diode assembly comprising a tubular anode within a tubular cathode is located in the core of a nuclear reactor. Ceramic spacers and seals are located at the ends of the diode tubes outside the reactor core. A conductive coolant system is connected directly to the ends of the tubular anodes of a first group of diodes. A conductive bus connects the cathodes of the first group of diodes to complete a parallel arrangement. A second group of diodes in a similar parallel arrangement is connected in series with the first by a direct electrical connection from the bus of one group to the coolant system of the other. Each coolant system is independent of the others and is driven by a separate pumping device that preserves the electrical integrity of the diodes connected thereto.

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**3,673,441**

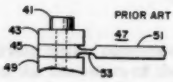
**CONTROL APPARATUS**

**Larry H. Royster, Cary, N.C., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed May 1, 1969, Ser. No. 820,927**

**Int. Cl. H04r *17/00***

**U.S. Cl. 310—8.6** **4 Claims**




A spring mounted transducer where the plane of the spring is perpendicular to the longitudinal axis of the transducer and is parallel to the direction of flexure of the transducer. The mounting of the spring is at the transducer centerline for greater efficiency and longer life and the spring in an optional embodiment has a reduced thickness flexing section at the centerline of the transducer along with an improved clamp for greater spring reliability.

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**3,673,442**

**TEMPERATURE COMPENSATED PIEZOELECTRIC ACCELEROMETER**

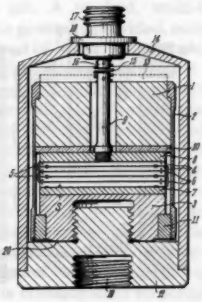
**Hans Conrad Sonderegger, Sulz-Rickenbach Im Dornler, Switzerland**

**Continuation of Ser. No. 430,629, Feb. 5, 1965. This application Dec. 4, 1967, Ser. No. 701,799**

**Claims priority, application Switzerland, Feb. 14, 1964, 2099/64**

**Int. Cl. H04r *17/00***

**U.S. Cl. 310—8.4** **13 Claims**



An acceleration measuring device which includes within a casing a piezo-electric system, a seismic mass and a relatively fixed abutment; temperature-compensating elements are provided at the outer end or ends of the piezo-electric system which have a coefficient of expansion greater than that of the materials of the adjacent elements.

3,673,443

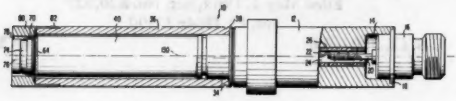
## PRESSURE TRANSDUCER WITH REDUCED TEMPERATURE SENSITIVITY

Vernon H. Siegel, Clarence, N.Y., assignor to Sundstrand Data Control Incorporated, Redmond, Wash.

Continuation of Ser. No. 22,132, April 1, 1970, abandoned, which is a continuation of Ser. No. 703,621, Feb. 7, 1968, abandoned. This application Dec. 31, 1970, Ser. No. 103,330

Int. Cl. H01v 7/00

U.S. Cl. 310—8.7 2 Claims



Disclosed is a piezoelectric pressure transducer particularly suited for use with an engine gauge for measuring pressures in internal combustion engines or for sensing pressure in other severe temperature environments. A thin, flat diaphragm is protected by a ceramic shield and other elements of the gauge are made of material having a low thermal expansion such as invar. Access to the diaphragm is by way of a small annular, stepped groove to cool the gases acting on the diaphragm. A piezoelectric element such as quartz having two sensitive axes is employed and long term temperature effects are nullified by applying compensating stresses to the second axis of the piezoelectric element.

3,673,444

## ROTARY ELECTRIC MACHINE

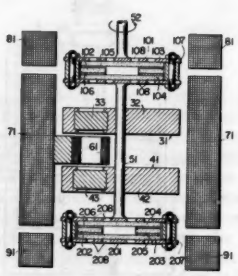
Ushio Kawabe, Nishitama; Hiroshi Kimura, Kita; Hiroshi Tomeoku, Hachioji, and Toshio Doi, Minamitama, all of Japan, assignors to Hitachi, Ltd., Chiyoda-ku, Tokyo, Japan

Filed Oct. 9, 1970, Ser. No. 79,546

Claims priority, application Japan, Oct. 9, 1969, 44/80794

Int. Cl. H02k 9/00

U.S. Cl. 310—10 11 Claims



A rotary electric machine having a superconducting rotor and bearings, which utilize the magnetic solid property of an inhomogeneous hard superconducting material, for forming an a.c. generator or motor.

3,673,445

## DUST SEAL FOR ELECTRIC MOTORS

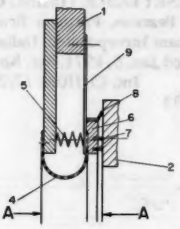
Hansrudolf Rutz, Wettingen, and Tassilo Schmollinger, Gebenstorf, both of Switzerland, assignors to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Dec. 21, 1970, Ser. No. 99,836

Claims priority, application Switzerland, Jan. 7, 1970, 95/70

Int. Cl. H02k 5/12

U.S. Cl. 310—88 4 Claims



A dust seal structure applied to electric motors to prevent ingress of dust and other foreign matter into the air gap between the stator and rotor includes a stator supported ring-shaped lip seal member and a ring-shaped spacer member which bear in an axial direction against a corresponding surface on the rotor. The lip seal and spacer members are mounted on an axially movable support ring which is carried by the radially inner ends of a circumferential array of flexible strips whose outer ends are secured to the stator, and compression springs associated with the flexible strips exert an axially directed force which is transmitted to the lip seal and spacer members thus to enable the latter to follow any axial movements of the rotor. The spacer member which is non-yieldable absorbs axial thrust exerted by the springs and thus prevents the lip seal from being deformed as well as acting as a guide for the seal.

3,673,446

## INDUCTION DISC TYPE RELAY

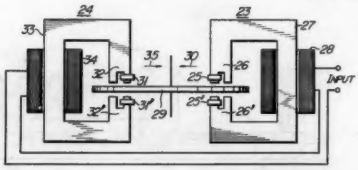
Mitsuo Watai, Mito, and Koya Ito, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 19, 1970, Ser. No. 91,013

Claims priority, application Japan, Nov. 21, 1969, 44/92969

Int. Cl. H02k 17/10

U.S. Cl. 310—172 4 Claims



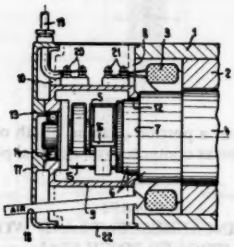
An induction disc type relay adapted to apply to an induction disc a rotational torque proportional to an input so that an operating output is produced at the expiration of a predetermined time dependent on the magnitude of the input after the application of the input. Included in the relay are two sets of shading coils and reluctance paths responsive to the same input signal for applying the rotation torque to the induction disc, whereby and desired time lag characteristic can be readily obtained.

3,673,447

## COMMUTATOR COOLING MEANS

Bruno Zumbach, Grunematttstrasse 8, CH-2552, Orpund-Biel, and Heinz Zumbach, Bartolomausweg 16, CH-2500, Biel, both of Switzerland

Filed Aug. 20, 1968, Ser. No. 760,382
Claims priority, application Switzerland, Aug. 24, 1967, 11907/67
Int. Cl. H02k 9/28
U.S. Cl. 310—227 8 Claims



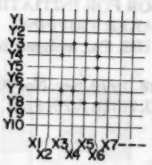
An electric machine having a rotor winding connected to a collector or to slip rings and brushes contacting said collector or slip rings, said collector or slip rings and brushes being capsuled in a supporting structure for the one bearing of the machine and the brushes, axial cooling-air ducts being formed in said structure for admitting cooling air to the windings of the machine.

3,673,448

## CATHODE RAY TUBES HAVING ROW AND COLUMN ELECTRODES ATTACHED TO OPPOSITE SIDES OF INSULATING SUBSTRATE

Tadashi Nakamura, Ise, Japan, assignor to Ise Electronics Corporation, Ise, Japan

Filed Oct. 8, 1969, Ser. No. 864,798
Claims priority, application Japan, Oct. 12, 1968, 43/73904
Int. Cl. H01j 29/46, 29/06, 29/74
U.S. Cl. 313—86 1 Claim



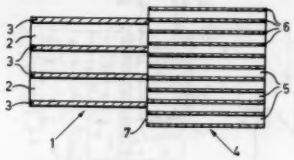

In a cathode ray tube wherein an electron beam emitted from a cathode electrode is focused by an electron lens and deflected by a deflecting device upon a flourescent screen, a character forming means is provided across the path of the electron beam comprising an insulating substrate and electrode elements formed on the opposite sides of the substrate which are arranged in a matrix. The substrate and electrode elements are formed with aligned perforations at respective cross points of the matrix and the perforations of the electrode elements at selected cross points are caused to create positive field to permit passage of the electron beam to display a selected character, numeral or pattern.

3,673,449

## CHANNEL AMPLIFYING DEVICE COMPRISING A PLURALITY OF COUPLED CHANNEL PLATES

Gilbert Eschard, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed April 1, 1970, Ser. No. 24,675
Claims priority, application France, April 4, 1969, 6910558
Int. Cl. H01j 43/00
U.S. Cl. 313—105 3 Claims



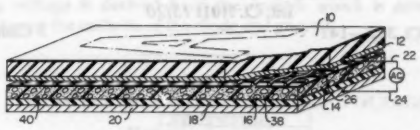

A channel amplifying device comprising a plurality of coupled channel plates, the diameters of the channels on either side of the coupling area being different from each other, one channel of one of the channel plates opening out in a plurality of channels of the channel plate coupled therewith.

3,673,450

## ELECTROLUMINESCENT TECHNIQUES AND DEVICES

Sam L. Leach, Palos Verdes Peninsula, Calif., assignor to Spectra-Tech Corporation, El Segundo, Calif.

Filed Jan. 30, 1970, Ser. No. 7,157
Int. Cl. H01j 1/62
U.S. Cl. 313—108 A 11 Claims



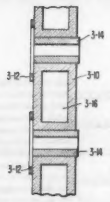

New electroluminescent techniques and devices are disclosed which render a product that is more commercially saleable, reliable, and economically feasible than heretofore was the case in the art. A stacked, multi-layered electroluminescent device is generally provided, comprising a first supporting layer or sheet of Mylar, for example, a front electrode that is transparent or at least translucent to visible light, a phosphor-filled layer of dielectric material, an additional dielectric layer if desired, and a rear electrode plate. Disposed in intimate contact with the front electrode and preferably between the electrode and the phosphor-filled layer is a web of electrically conductive filaments to obviate deleterious effects of electrode separations. The provision of a photo-sensitive electrically conductive material as the rear electrode is contemplated, which material can be photographically exposed and then developed so as to produce any desired pattern or configuration of electroluminescence. The phosphor-filled layer itself is contemplated to comprise a chemically inert layer of polypropolyene, for example, this layer being made electrically conductive by the insertion of a plurality of electrically conductive particulates dispersed throughout so as to thereby effectively control the dielectric constant thereof. Desirably, the electrically conductive particulates comprise phosphor particles novelly processed to include an adsorbed layer in the form of a glass coating thereon, the glass coating itself being provided with a discontinuous layer of stannous oxide.

**3,673,451**

## LUMINOUS GAS ALPHANUMERIC DISPLAY DEVICE

Raymond W. Tackett, Exton, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sept. 30, 1969, Ser. No. 862,365
Int. Cl. H01j 61/66, 61/32
U.S. Cl. 313—109.5 4 Claims



An array of luminous gas portions of a common envelope is used to present an alphanumeric display. The common envelope has a plurality of openings arranged in a matrix-like configuration. Each opening has a central conductor, while a common conductor encircles all of the central conductors. The selective application of a predetermined potential between one of the central conductors and the common conductors causes the luminous gas in the envelope surrounding the selected conductor to glow. By simultaneously applying the potential to a selected plurality of central conductors and the common conductor a luminous display is provided.

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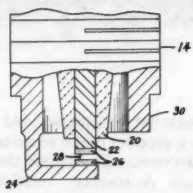
**3,673,452**

## SPARK PLUG

Ronald F. Brennen, 3921 Crystal Lake Drive, Pompano Beach, Fla.

Filed Sept. 21, 1970, Ser. No. 73,735
Int. Cl. H01t 13/20
U.S. Cl. 313—141 5 Claims



A spark plug for a combustion engine or a combustion chamber, in which the electrodes of ferrous metals or ferroalloys have a coating fused directly thereon by a process known in the art as "electronic sputtering." The coating forms a very thin laminar deposit of a high temperature resistant metal, for example, one of the carbides of tungsten, titanium and chromium.

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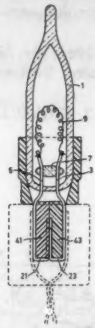
**3,673,453**

## ELECTRIC LAMP COMPRISING A LAMP BASE OF A SYNTHETIC MATERIAL

Cornelis Prijn, Emmasingel, Eindhoven, Netherlands, and Franco Benedetti, Condove, Italy, assignors to U.S. Philips Corporation, New York, N.Y.

Filed April 27, 1970, Ser. No. 32,286
Claims priority, application Netherlands, May 2, 1969, 6906704
Int. Cl. H01j 5/48
U.S. Cl. 313—318 1 Claim

An electric lamp comprising a lamp base of a synthetic resin in which current conductors projecting from the envelope of the lamp extend over a portion of their length outside of the lamp base to function as contacts to an external power supply.



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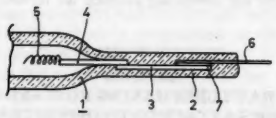
**3,673,454**

## ELECTRIC INCANDESCENT LAMP WITH AN IMPROVED PINCH SEAL

Victor Rosalie Noteltelrs, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 28, 1970, Ser. No. 84,775
Claims priority, application Netherlands, Nov. 1, 1969, 6916499
Int. Cl. H01j 5/52
U.S. Cl. 313—332 3 Claims



An electric incandescent lamp, having a quartz bulb provided with at least one pinch seal, has substantially reduced cracking of the pinch seal during operation of the lamp by the interposition of a foil of vanadium or vanadium alloy between the usual thin foil molybdenum connection to the wire-type current conductors of the lamp.

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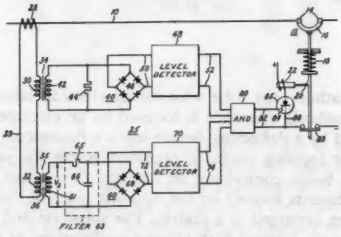
**3,673,455**

## HIGH SPEED SENSOR FOR INITIATING CIRCUIT BREAKER TRIPPING

Clyde G. Dewey, Drexel Hill, Pa., assignor to General Electric Company

Filed Nov. 18, 1970, Ser. No. 90,567
Int. Cl. H02h 7/26, 3/08
U.S. Cl. 317—29 R 6 Claims




Discloses a high speed sensor for initiating tripping of a transmission-line circuit breaker in response to the occurrence of a fault on the transmission line. Comprises current-

magnitude sensing means and rate-of-change of current sensing means that coact to produce sensor operation when the instantaneous magnitude of the line current and its rate of change for a predetermined duration exceed predetermined levels.

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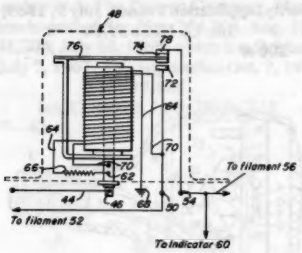
**3,673,456**

**HEADLIGHTS WITH SAFETY RELAY CONTROL**

Wesley Allan Sonius, 315 E. Cedar, Pocatello, Idaho

Filed Jan. 29, 1970, Ser. No. 6,811
Int. Cl. B60q *1/04, 9/00*
U.S. Cl. 315—83 6 Claims




A dual winding relay is connected between the voltage source and headlights of a vehicle. When circuit continuity through the headlight low beam filaments is present, both windings on the relay conduct and cause full energization and switch-over of the relay contacts to a first state completing a current path through the low beam filaments. In the event a low beam filament is burned out, only one of the windings will become energized. Under these circumstances, the relay maintains a second state whereby the relay contacts connect the voltage source with a standby low beam filament.

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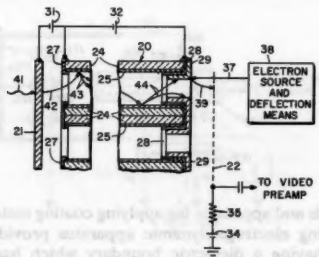
**3,673,457**

**HIGH GAIN STORAGE TARGET**

William M. Sackinger, Bath, and Robert A. Simms, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 25, 1969, Ser. No. 879,787
Int. Cl. H01J *29/41*
U.S. Cl. 315—12 7 Claims



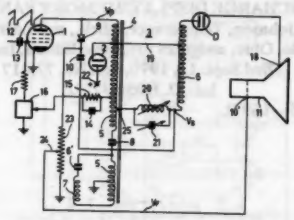

An image conversion device of the type wherein an input photon image is converted to a photoelectron image which creates on a storage target a charge pattern corresponding to the input optical image. According to this invention a multichannel plate is disposed in intercepting relationship with the photoelectrons to provide electron multiplication of the photoelectron image.

**3,673,458**

**CIRCUIT ARRANGEMENT COMPRISING SWITCHING MEANS FOR PERIODICALLY INTERRUPTING A CURRENT SUPPLIED TO AN INDUCTING COIL**

Anthonie Jannis Moggre, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Phillips Corporation, New York, N.Y.

Filed Nov. 17, 1969, Ser. No. 877,199
Claims priority, application Netherlands, Nov. 20, 1968, 6816601
Int. Cl. H01J *29/70*
U.S. Cl. 315—27 R 6 Claims



A circuit for obtaining a focus voltage that varies with the final anode voltage has a rectifier, a resistor, and a capacitor connected to a horizontal output transformer, which is specially designed to be resonant at the fifth harmonic. The series arrangement of the diode and the capacitor is connected between primary and secondary windings of the transformer, namely the anode of the diode is connected to a tap on the primary, and the remaining end of the capacitor is connected to that end of the secondary winding to which a capacitor for the fifth harmonic tuning is connected. The other capacitor end is connected to a tap on the primary. The latter tap comprises a much smaller number of turns than the first-mentioned tap to which the anode of he diode is connected. The required focusing voltage is derived from the resistor which is arranged between the cathode of the diode and ground.

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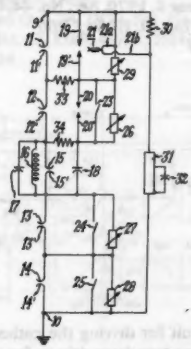
**3,673,459**

**TWO-WIRE PREIONIZER FOR SURGE VOLTAGE ARRESTERS**

Thomas J. Carpenter, Pittsfield, Mass., assignor to General Electric Company

Filed Nov. 18, 1970, Ser. No. 90,654
Int. Cl. H01t *1/00*
U.S. Cl. 315—36 11 Claims



A preionizer for a surge voltage arrester, such as a lightening arrester, is formed by twisting the ends of a pair of wires, at least one of which is insulated except at its end, together so

that the exposed ends of the wires form an ionizing gap that is essentially as long as the thickness of insulation between the two wires. After the ionizing gap is formed, an epoxy bead is used to encapsulate the twisted portion of the preionizer in order to maintain the desired gap spacing. The epoxy bead may also be utilized to position the ionizing gap adjacent a main gap or a trigger gap that is to have its sparkover level stabilized by the preionizing action of the twisted-wire preionizer of the invention.

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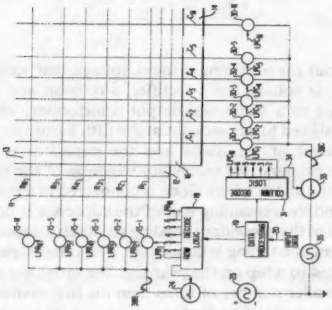
**3,673,460**

## LOW VOLTAGE PULSE SYSTEM FOR ADDRESSING GAS DISCHARGE DISPLAY/MEMORY PANELS

**William E. Johnson, Temperance, Mich., and Larry J. Schmersal, Toledo, Ohio, assignors to Owens-Illinois, Inc.**

**Filed Sept. 15, 1970, Ser. No. 72,417**
**Int. Cl. H05b *37/02***
**U.S. Cl. 315—169 R** **4 Claims**



There is disclosed a low voltage pulse addressing system for addressing gas discharge display/memory panels wherein a portion of the pulse voltage is combined with the sustainer voltage so as to reduce the voltage required from each line drive pulsing circuit so as to permit utilization of low voltage integrated circuits.

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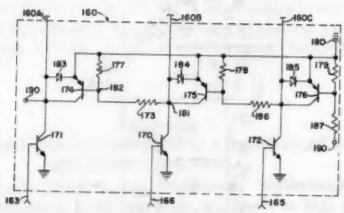
**3,673,461**

## CIRCUIT FOR DRIVING THE CATHODES OF A DISPLAY DEVICE

**Mark F. Eisenberg, North Plainfield, N.J., assignor to Burroughs Corporation, Detroit, Mich.**

**Filed June 8, 1970, Ser. No. 44,434**
**Int. Cl. H05b *37/00***
**U.S. Cl. 315—169 TV** **7 Claims**



A multiphase circuit for driving the cathodes of a gas cell display device utilizing transistor drivers for sequentially driving each phase and switching circuitry cooperating with the drivers for de-energizing the previously "on" cathodes and rapidly shutting off the previously operating driver. The cells energized by an "on" cathode are caused to glow when there is a concurrent signal on the proper anode. The output of each driver is coupled to a switching transistor which, when caused to conduct, feeds a standoff voltage to a preceding phase and the collector of the driver associated with that phase, rapidly restoring the phase to a voltage level below the ionization point of the gas cells. A resistor across the emitter and base of the switching transistor maintains a proper bias and a diode across its collector and emitter protects the switching transistor from surges at shutdown.

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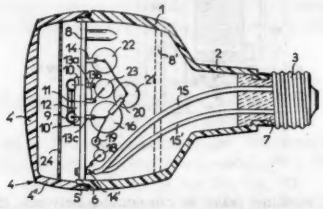
**3,673,462**

## FLASHING ELECTRIC LAMP

**Jean Rene Marie Girard, Boulogne sur Seine, France, assignor to Orthotron, Long-Jumeau, France**

**Filed July 7, 1970, Ser. No. 52,968**
**Claims priority, application France, July 9, 1969, 6923304**
**Int. Cl. H05b *31/04***
**U.S. Cl. 315—200 A** **10 Claims**



The invention relates to a flashing electric lamp comprising a casing closed at the front by a removable glass and at the rear by a standard electric lamp base. A flashing electronic tube is located inside the casing and forms with electric components a relaxation oscillator. The invention has particular utility for signalling by lights, for illuminated decorations and for illuminated panels.

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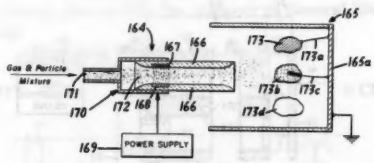
**3,673,463**

## METHODS AND APPARATUS FOR ELECTROGASDYNAMIC COATING

**Meredith C. Gourdine, West Orange, N.J., assignor to Gourdine Systems, Incorporated, Livingston, N.J.**

**Division of Ser. No. 601,270, Nov. 15, 1966, abandoned, which is a continuation-in-part of Ser. No. 512,083, Dec. 7, 1965, abandoned**
**This application June 30, 1969, Ser. No. 837,562**
**Int. Cl. B03c *3/06***
**U.S. Cl. 317—3** **4 Claims**




Methods and apparatus for applying coating materials to articles, using electrogasdynamic apparatus providing a flow channel having a dielectric boundary which has a length-/width ratio of greater than 2.5. Gas containing particulate coating material is ionized to create an electrical discharge field for imparting an electrical charge to the particles prior to passage through the dielectrically bounded flow path and thereby creating a high space charge potential. In special applications, a free-radical forming monomer gas or a fusible particle substance is carried in an inert gas into the electrical discharge field and through the flow channel toward the article to be coated. In any case, the charged particles are sub-

jected to an axial charge repelling field (due to space charge effects) in the flow channel to raise the electrical potential of the particles, and thereby the potential gradient between the particles and the workpiece.

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**ERRATUM**

For Class 317—29 R see:
Patent No. 3,673,455

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**3,673,464**

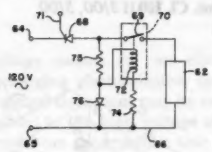
**ENERGIZATION SYSTEM WITH SAFETY PROVISION FOR FAULTY RECTIFIER**

**John T. Lamb, Mansfield, and Carl L. Anderson, Shilon, both of Ohio, assignors to The Tappan Company, Mansfield, Ohio**

**Continuation-in-part of Ser. Nos. 754,304, Aug. 21, 1968, and Ser. No. 841,200, July 14, 1969, which is a division of Ser. No. 651,865, July 7, 1967. This application Oct. 7, 1970, Ser. No. 78,825**

**Int. Cl. H02m *1/18*; H02h *7/10***

**U.S. Cl. 317—43** **3 Claims**



A fail-safe spark ignition system for gas burners includes a spark energy monitoring circuit for controlling the gas valve and bimetal spark gap disabling means for eliminating radio interference. Two circuit arrangements are shown for protection against short circuit failure of rectifiers energizing the gas-valve solenoid or other load from an AC power source, using a second rectifier and a fuse or fusible resistor for circuit disconnection.

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**3,673,465**

**STABILIZING MAGNETIC FIELDS**

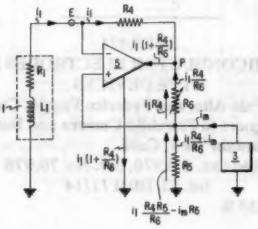
**Werner Tschopp, Eggenbergstrasse 11, Forch, Switzerland**

**Filed June 24, 1971, Ser. No. 156,241**

**Claims priority, application Switzerland, Oct. 13, 1970, 15111/70**

**Int. Cl. G05f *7/00***

**U.S. Cl. 317—123** **10 Claims**



A method and apparatus for automatically stabilizing the magnetic field produced by a coil, the stabilization being effected by connecting between the ends of the coil an electronic device which provides a negative resistance which is equal in magnitude to the resistance of the path over which current flows through the coil, so that the resistance between the coil ends is essentially zero and flux disturbances are automatically compensated by the counterflux induced in the coil by such disturbances.

**3,673,466**

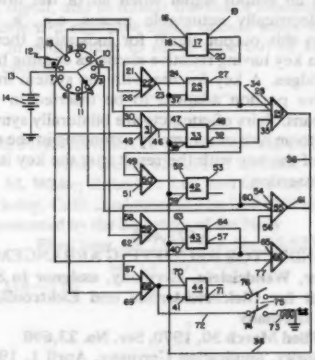
**SEQUENCE ELECTRONIC COMBINATION LOCK**

**Paul C. Krueger, 20 Wabash Ave., Wharton, N.J.**

**Filed May 14, 1971, Ser. No. 143,379**

**Int. Cl. E05b *49/00***

**U.S. Cl. 317—134** **9 Claims**



An electronic combination lock circuit which includes a source of direct current connected to the rotary pole of plural position switch. The pole connects the source to selected switch contacts in a predetermined sequence and order. The contacts are applied to combination of "AND" and bistable elements whereby the switch must first be set to a "ready" contact before the combination number which by selective action controls the direction of rotation. In the event the switch is rotated past the combination number, the bistable elements are reset and the lock memory is wiped clean. Thus after the first combination number is dialed, the direction of rotation reversed, and the next combination number dialed subsequent to the second "ready" number and again, if passed, the memory is reset. This is repeated for all the combination numbers after which the source is applied so as to a utilization network or to operate a release, alarm, or other output component. It is clear that other variations can be included as for example, having to pass a combination number more than once before proceeding to the next term.

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**3,673,467**

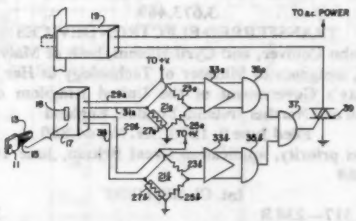
**RESISTIVELY-CODED SECURITY SYSTEM**

**William Eisenreich, White Plains, N.Y., assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Oct. 28, 1970, Ser. No. 84,679**

**Int. Cl. E05b *49/00*; H01c *1/02***

**U.S. Cl. 317—134** **10 Claims**



An electronic key-actuated security system including keys each constituted by a plurality of electrically resistive elements. Key-receiving means includes conductors which provide connections with resistive elements of a key received. The system includes a plurality of bridges each associated with

one of the resistive elements of a key received. Each of said bridges has first, second and third impedance arms, a respective one of the key resistive elements being connected as a fourth impedance arm of each said bridge. The first and second arms define a first preset impedance ration, and the third and fourth arms define a second impedance ration, the bridge being electrically balanced when these ratios are equal. Logic gate means is interconnected with each of the bridges and supplies an output signal when all of the bridges are balanced. Electrically actuatable means, e.g., a latch, is responsive to this output signal for indicating thereby the receiving of a key having resistive elements causing balancing of all the bridges. A key for use with the system includes a nonconductive portion adapted to be inserted in the key-receiving means. Pairs of contacts are bilaterally symmetrical with respect to an axis of symmetry extending in the direction of insertion of the key with the result that the key is adapted for bilateral insertion.

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**3,673,468**

**SEMICONDUCTOR RECTIFYING ARRANGEMENT**

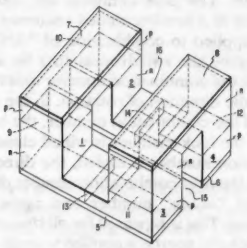
**Horst Schafer, Wendelstein, Germany, assignor to Semikron Gesellschaft fur Gleichrichterbau und Elektronik m.b.H., Nurnberg, Germany**

**Filed March 30, 1970, Ser. No. 23,690**

**Claims priority, application Germany, April 1, 1969, P 19 16 555.0**

**Int. Cl. H01l *5/00***

**U.S. Cl. 317—234** **9 Claims**



A single plate of semiconducting material is provided with n-conducting and p-conducting zones at predetermined locations. The grooves are placed in the plate as a function of the location of the n- and p-conducting zones. Metal conductive paths are then placed on the semiconducting plate as a function of the location of the n- and p-conducting zones and the grooves. There results, for example, a rectifying bridge circuit formed in a single piece of semiconducting material.

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**3,673,469**

**TRANSFERRED ELECTRON DEVICES**

**David John Colliver, and Cyril Hilsum, both of Malvern, England, assignors to Minister of Technology in Her Britanic Majesty's Government of the United Kingdom of Great Britain and Norther Ireland, London, England**

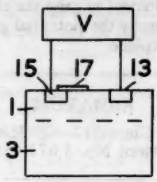
**Filed June 9, 1970, Ser. No. 44,850**

**Claims priority, application Great Britain, June 10, 1969, 29,476/69**

**Int. Cl. H01l *9/00***

**U.S. Cl. 317—234 R** **3 Claims**

A transferred electron device, such as an oscillator, comprises a body of semiconductor material exhibiting the transferred electron effect, a cathode on the body comprising a region of metal giving good ohmic contact with the body and an anode on the body giving efficient extraction of current carriers and consisting of material other than a metal which would give good ohmic contact. The anode may be an $n^+$ region of semiconductor or a Schottky barrier diode. The structure is suited to higher frequency operation with larger physical device dimensions.

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**3,673,470**

**HOUSING FOR TRANSISTORS HAVING UNSOLDERED CONNECTIONS FOR OPERATING AT VERY HIGH FREQUENCIES**

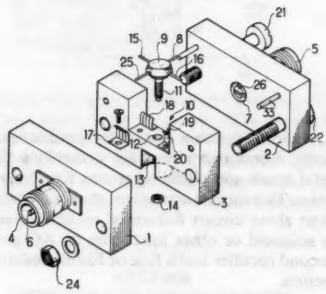
**Guy Louvel, Antony, France, assignor to Compagnie Industrielle Des Telecommunications cit-Alcatel, Paris, France**

**Filed May 27, 1971, Ser. No. 147,561**

**Claims priority, application France, May 27, 1970, 7019386**

**Int. Cl. H01l *3/00, 5/00***

**U.S. Cl. 317—234 R** **3 Claims**



The device enables a transistor to be removed from a circuit without its connections having to be unsoldered or soldered again, and comprises a middle part bearing the transistor, one of whose electrodes is connected to the ground of the middle part and two lateral flanges fitted with plug sockets for receiving the other two electrodes of the transistor. The middle part and the two flanges can be installed together by means of screws. The two flanges can also be installed without the middle, allowing the invention to be used for making measurements on power amplifiers at frequencies greater than 1 Gc/s.

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**3,673,471**

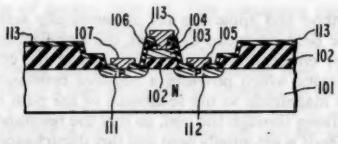
**DOPED SEMICONDUCTOR ELECTRODES FOR MOS TYPE DEVICES**

**Thomas Klein, Palo Alto, and Federico Faggin, Cupertino, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.**

**Filed Oct. 8, 1970, Ser. No. 70,978**

**Int. Cl. H01l *11/14***

**U.S. Cl. 317—235 R** **1 Claim**




The threshold voltage required to invert an MOS device is

both shifted and selectively controlled by using appropriately doped semiconductor material as the gate electrode.

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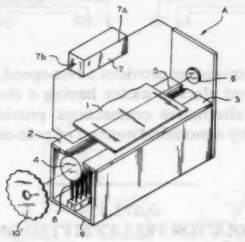
**3,673,472**

## ELECTROSTATIC PHOTOCOPYING MACHINE

**Raymond B. J. Liebens, Brussels, Belgium, assignor to ICP, Inc., Skokie, Ill.**

**Filed March 23, 1970, Ser. No. 21,978**
**Int. Cl. H01t *19/00***
**U.S. Cl. 317—262 A** **6 Claims**



A high voltage means for an electrostatic photocopy machine for charging photosensitive copy paper so that an image of an original document may be superimposed thereon. A wire connected to the high voltage side of a high voltage source is spaced from the sensitive side of the copy paper. A roller positioned in an opposed relationship with the wire moves the copy paper through the high voltage means. The peripheral edge of the roller is electrically conductive and connected to the reference voltage side of the high voltage.

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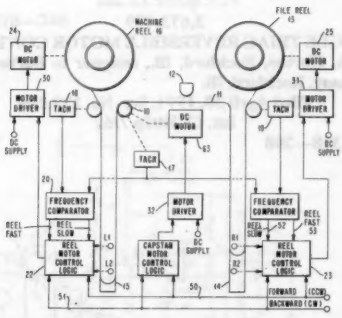
**3,673,473**

## MAGNETIC TAPE UNIT REEL MOTOR TENSION CONTROL

**Allen J. Werner, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Oct. 19, 1970, Ser. No. 81,993**
**Int. Cl. B65h *23/20*; H02p *5/00***
**U.S. Cl. 318—7** **6 Claims**




A magnetic tape unit having a machine reel, a file reel, a machine vacuum column, a file vacuum column and a reversible capstan disposed between the vacuum columns. An upper and a lower tape loop position sensor is located in each column. These sensors control the associated reel motor to institute a brake mode of operation therefore when the loop is between the sensors, and to institute a drive mode of operation, to move tape in the same direction as the capstan is moving tape, whenever the loop is in danger of being pulled out of a column or of being buttoned in a column.

A digital capstan tachometer is driven by the capstan, and two digital tape tachometers, one located on each reel-side of a vacuum column, are driven by the tape adjacent the reel. The outputs of the tape tachometers are compared to the output of the capstan tachometer to originate a reel-fast or a reel-slow signal for each reel. These signals are utilized to modify control of the associated reel motor in a manner to inhibit the drive mode and institute a coast mode upon the presence of a reel-fast signal, and to inhibit the brake mode and institute a coast mode if a reel-slow signal occurs when the capstan is rotating in a direction to move tape out of the associated vacuum column.

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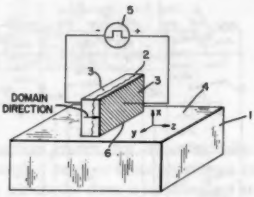
**3,673,474**

## MEANS FOR GENERATING (A SOURCE OF) SURFACE AND BULK ELASTIC WARES

**Richard M. White; Robert E. Lee, and Charles W. Turner, all of Berkeley, Calif., assignors to The United States of America as represented by the Secretary of the Navy**

**Filed Sept. 25, 1970, Ser. No. 75,523**
**Int. Cl. H01v *7/00***
**U.S. Cl. 318—116** **8 Claims**




A source of high frequency elastic waves are generated by placing a Gunn effect oscillator in close proximity to a piezoelectric or an electrostrictive solid. The device creates a moving source of sound near the surface of the solid. The sound will be radiated from the surface of the solid as bulk or surface elastic waves. Elastic waves can be generated from both surfaces in certain situations.

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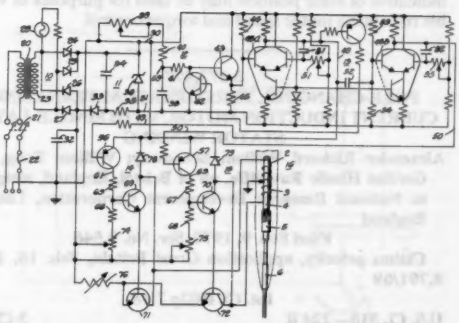
**3,673,475**

## PULSE DRIVE CIRCUIT FOR COILS OF DENTAL IMPACT TOOLS AND THE LIKE

**Ralph H. Britton, Jr., Palo Alto, Calif., assignor to Fred M. Hufnagel, Nevada City, Calif.**

**Filed Sept. 15, 1970, Ser. No. 72,277**
**Int. Cl. H02k *33/12***
**U.S. Cl. 318—122** **10 Claims**



A drive circuit for dental percussion tools or hammers and the like including a power supply coupled with a timing circuit

which provides suitable output pulses of selectable frequency. The output of the timing circuit is connected to a recoil-drive pulse forming circuit which includes one shot multivibrators one of which generates recoil pulses and the other of which generates drive pulses immediately following the recoil pulses. These pulses are amplified and applied to the solenoid of the dental hammer unit to alternately energize coils of the solenoid to cause the armature to reciprocate rapidly and impart repetitive impacts to a tool element. The circuit includes means for enabling adjustment of pulse frequency, pulse width and pulse amplitude.

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**3,673,476**

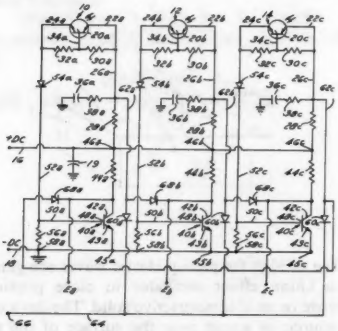
## SIGNAL PRODUCING APPARATUS ADAPTABLE FOR USE WITH VARIABLE RELUCTANCE MOTORS

**Douglas R. Hamburg, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed March 8, 1971, Ser. No. 121,655**

**Int. Cl. H02k *29/00***

**U.S. Cl. 318—138** **7 Claims**



A circuit is described for producing periodic electrical signals upon the repeated sequential activation of a plurality of sensor units. The sensor units preferably include solid state switching devices in the form of light-activated silicon-controlled rectifiers. The circuit may be used to indicate the relative angular velocity of one body rotating with respect to another body. In such case, the electrical signals have frequencies proportional to the angular velocity of the rotating body. When applied to disc-type variable reluctance motors, the circuit may be used with additional apparatus to indicate the position of the motor's rotor relative to its stator. The signal indicative of rotor position may be used for purposes of variable reluctance motor speed and torque control.

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**3,673,477**

## POLE-CHANGING, THREE-PHASE ALTERNATING CURRENT INDUCTION MOTOR, WITH SINGLE-LAYER STATOR WINDING

**Alexander Richard William Broadway; William Fong, and Gordon Hindle Rawcliffe, all of Bristol, England, assignors to National Research Development Corporation, London, England**

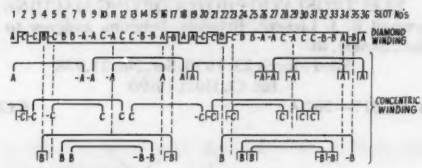
**Filed Feb. 9, 1970, Ser. No. 9,546**

**Claims priority, application Great Britain, Feb. 18, 1969, 8,791/69**

**Int. Cl. H02p *7/48***

**U.S. Cl. 318—224 R** **3 Claims**

A three-phase, two-speed pole-changing induction motor, using the pole-changing method of pole-amplitude modulation, which has a single-layer stator winding, diamond or concentric coils being used as preferred. The stator coil layout is derived from the stator coil layout of a corresponding double-layer winding for the same alternative pole-numbers.




The present invention provides a two-speed, three-phase alternating current electric motor having a single layer stator winding with alternative connections providing alternative pole-numbers by a modified method of pole-amplitude modulation.

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**3,673,478**

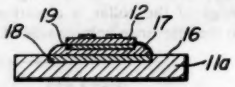
## SEMICONDUCTOR PELLET FITTED ON A METAL BODY

**Hideru Osoegawa, Kodaira-shi, and Katuei Kobayashi, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Division of Ser. No. 763,201, Sept. 27, 1968. This application Oct. 31, 1969, Ser. No. 871,802**

**Int. Cl. H01l *3/00***

**U.S. Cl. 317—234 R** **7 Claims**




A semiconductor device which includes a metal lead, a metal foil of gold or the like connected with the metal lead by way of a first intermediate alloy layer which is formed between the metal lead and the metal foil, and a semiconductor pellet fixed to the metal foil with a second intermediate alloy layer formed between the semiconductor material and the metal foil.

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**3,673,479**

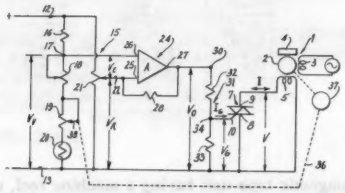
## SINGLE TRIAC REVERSIBLE MOTOR CONTROL

**Alfred A. Horton, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.**

**Filed April 30, 1971, Ser. No. 139,089**

**Int. Cl. H02p *7/62***

**U.S. Cl. 318—208** **10 Claims**



A single phase AC motor, biased to rotate in one direction, is made to stop when a controlled circuit tending to cause rotation in the opposite direction is energized by a half wave rectified alternating current and is made to rotate in the opposite direction when the controlled circuit is energized by alternating current. A triac rectifies the control current when fired in only one quadrant and passes alternating current when fired in two quadrants, a modulated DC gating current deter-

mining whether the triac is fired in one quadrant, in two quadrants or in none. Speed control may be exercised by controlling the phase angle of the firing.

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**3,673,480**

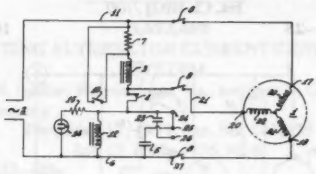
**CIRCUIT FOR OPERATING POLYPHASE INDUCTION MOTORS FROM SINGLE PHASE SUPPLY**

**Colin G. Johnstone, 38732 Puerta St., Palmdale, Calif.**

**Filed Oct. 26, 1970, Ser. No. 83,847**

**Int. Cl. H02p *1/44***

**U.S. Cl. 318—221 G** **16 Claims**



A circuit for providing the phased currents necessary for starting and operating polyphase motors from a single phase voltage supply. Out of phase currents are obtained by connecting a capacitor to one or more of the motor windings. Upon the motors' reaching nearly full speed, a potential voltage relay operates to remove the capacitor from the motor circuit. Chatter of the potential voltage relay is avoided by inclusion in the circuit of a series resistor which is selectively shorted by a further relay connected in parallel with the starting capacitor.

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**3,673,481**

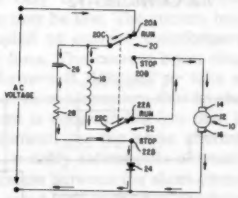
**DYNAMIC BRAKING FOR UNIVERSAL MOTORS**

**James T. Hardin, Lambertville, Mich., assignor to Eltra Corporation, Toledo, Ohio**

**Filed May 20, 1970, Ser. No. 39,098**

**Int. Cl. H02p *3/24***

**U.S. Cl. 318—246** **5 Claims**




A dynamic braking system for universal electric motors operating on alternating current is disclosed which utilizes the discharge of a condenser to momentarily energize the series field of the motor after the power circuit to the motor is broken and the field connected accross the terminals of the rotating armature to initiate dynamically braking of the armature to bring it to a stop within a few revolutions.

**3,673,482**

**AUTOMATICALLY OPERATING AND CONTROLLING RECIPROCATING MOTION**

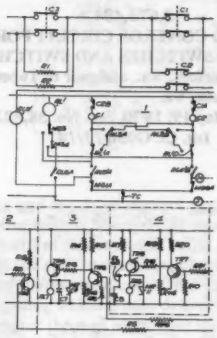
**Anthony Walter Davey, Hathern, England, assignor to Herbert Morris Limited, Loughborough, Leicester, England**

**Filed March 5, 1971, Ser. No. 121,337**

**Claims priority, application Great Britain, March 12, 1970, 11,816/70**

**Int. Cl. H02p *7/36***

**U.S. Cl. 318—266** **6 Claims**



A linear induction motor for automatically operating a reciprocating member or door incorporating a control system for the motor by which the door is accelerated at full thrust to travelling speed, means for reducing the motor thrust to enable the door to coast at approximately constant speed until reaching a limit switch which initiates reverse thrust braking, with means to automatically cut out the braking as soon as the door has stopped and means for driving the door at low thrust to a final limit switch, an overspeed relay for initiating the reversal of the motor thrust when the door speed exceeds a predetermined value.

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**3,673,483**

**TWO-WAY DRIVE FOR OPTICAL SYSTEMS AND THE LIKE**

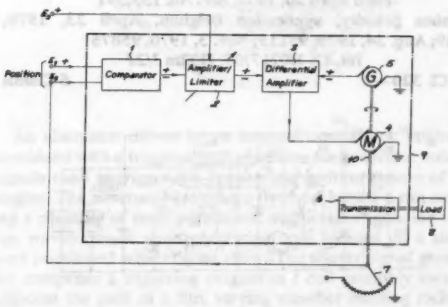
**Karl Gunter Hess, Waldlaubersheim, Germany, assignor to Jos. Schneider & Co. Optische Werke, Bad Kreuznach/Rhineland, Germany**

**Filed Oct. 12, 1970, Ser. No. 80,018**

**Claims priority, application Germany, Oct. 14, 1969, P 19 51 672.4**

**Int. Cl. G05b *5/01***

**U.S. Cl. 318—618** **4 Claims**




A load, such as a servomotor for the positioning (e.g. tilting) of a television camera, is operable by a control circuit

provided with an input ($E_1$) for a position signal and another input ($E_2$) for a speed signal. The positioning signal is applied, together with a feedback signal ($E_2$) from a position sensor, to a comparator whose positive or negative output generates an error signal of corresponding polarity and of a magnitude determined by the speed signal. A reversible load motor, coupled with the position sensor, also drives a generator to produce a reference signal of either polarity, the difference between the error signal and the reference signal producing a drive voltage of one or the other polarity for the load motor until the system is in balance.

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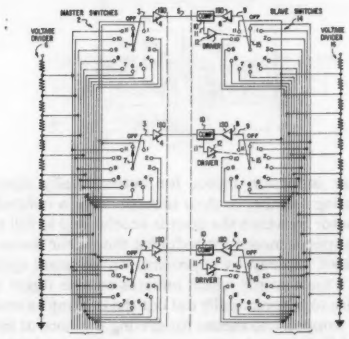
**3,673,484**

## REMOTE SERVO CONTROL CIRCUIT FOR REMOTE CONTROLLED SWITCHES AND SWITCHBOARDS

**Michael A. Tabet, Norfolk, Va., assignor to Tabet Manufacturing Co., Inc., Norfolk, Va.**

**Filed May 19, 1970, Ser. No. 38,823**
**Int. Cl. G05b *11/14***
**U.S. Cl. 318—674** **4 Claims**




A unique remote control circuit is used to permit the automatic control of switches and switchboards from a remote location. The remote control circuit of this invention permits such control with only one low-power control wire per switch. The control circuit is a simple transistorized comparator circuit which drives a rotary solenoid which causes the controlled or slave switch to move to a position corresponding to the position of the control or master switch.

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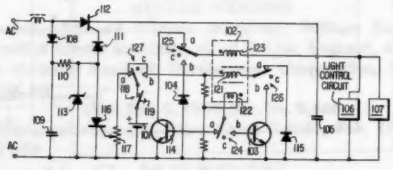
**3,673,485**

## DUAL OSCILLATOR CHARGER-INVERTER CIRCUIT

**Zoltan Vital, Brussels, and Jean Orban, Clabecq, both of Belgium, assignors to Photronic International Establishment, Vaduz, Liechtenstein**

**Filed April 20, 1971, Ser. No. 135,591**
**Claims priority, application Belgium, April 23, 1970, 88149; Aug. 24, 1970, 93115; Nov. 3, 1970, 95875**
**Int. Cl. H02j *7/00*; H02m *3/22***
**U.S. Cl. 320—2** **5 Claims**




In a system for supplying power to a load selectively from a rechargeable battery or from an external power source and for recharging the battery from such power source, a dual converter connectable between the battery, the load and the power source and including components forming a first converter for delivering power from the battery to the load and a second converter for converting the energy from the power source into oscillations and applying such oscillations for recharging the battery, the arrangement being composed of switch means for operatively connecting only one converter at a time, a single transformer core, and a plurality of winding wound on the core, with at least one of the winding being common to both converters.

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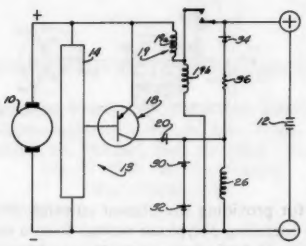
**3,673,486**

## BATTERY CHARGING SYSTEM

**Marion L. Snedeker, Cleveland, Ohio, assignor to VLN Corporation, Cleveland, Ohio**

**Filed Sept. 3, 1970, Ser. No. 69,234**
**Int. Cl. H02j *7/00***
**U.S. Cl. 320—25** **10 Claims**



A circuit for preventing the buildup of a generating system when it is inadvertently connected in a reverse polarity employs a resistor-diode series combination which is connected between the field winding of a generator that charges the battery and one terminal of the battery. When the battery is connected with a correct polarity, current flows through the field winding of the generator in one direction and no current flows through the diode since the diode is reverse biased. However, when the battery is connected with a reverse polarity, the diode is forward biased and current flows through the diode and its series resistor, and through a parallel combination of field discharge diodes and the field winding. The reverse current in the field will prevent the excitation necessary to build up a voltage output.

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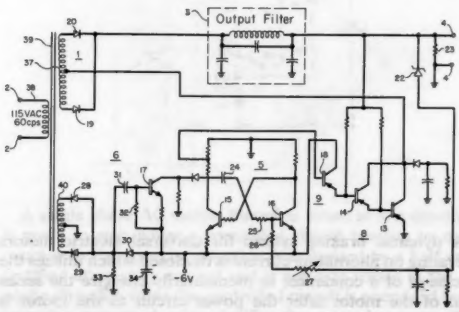
**3,673,487**

## REGULATED D.C. POWER SUPPLY

**Melvin C. Hendrickson, Elmhurst, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.**

**Filed Sept. 8, 1970, Ser. No. 70,193**
**Int. Cl. H02m *7/12***
**U.S. Cl. 321—18** **7 Claims**




A switching-type regulating power supply which dissipates little power, minimizes radio frequency interference, and pro-

vides a constant DC output voltage has a full-wave rectifier with a regulating means in its common return circuit to switch the full-wave rectified current supplied to an output filter on and off. The current is switched on when there is zero voltage across the full-wave rectifier thus minimizing radio-frequency-interference-causing surge currents, and this is accomplished by a phase synchronizer which is coupled to the input terminals of the full-wave rectifier and also coupled to the control means which applies a variable duty cycle control voltage to the regulating means. The control means is coupled to the output voltage filter and generates a variable duty cycle control voltage in response to changes in the DC output voltage of the supply. This varying duty cycle control voltage is applied to the regulating means to control the time in which the regulating means allows current to flow to the output filter which results in output voltage stabilization.

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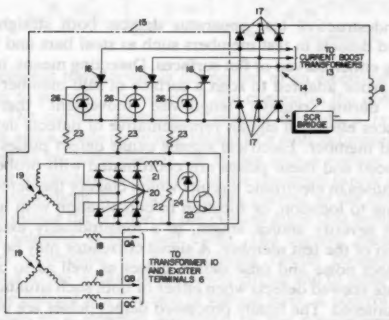
**3,673,488**

## ROTATING ALTERNATOR CURRENT GENERATOR SYSTEM

**William H. Spiller, Waynesboro, Va., assignor to General Electric Company**

**Filed May 17, 1971, Ser. No. 143,935**
**Int. Cl. H02p 7/06, 9/26**
**U.S. Cl. 322—28** **2 Claims**



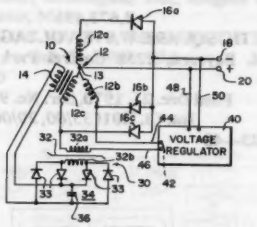

The invention relates to rotating alternating current generator systems. Generator excitation is normally controlled by varying the field current to the exciter. An SCR rectifier circuit responsive to exciter output voltage normally provides controlled direct current for the exciter field while a diode rectifier circuit responsive to exciter output current provides direct current only during transient conditions when the exciter voltage may be low. The current boost diode rectifier circuit is coupled to current transformers located in the exciter output lines. The current boost circuit including the current transformers is designed to take advantage of the characteristic of most alternators that its short-circuit excitation requirement is considerably less than its rated-load excitation requirement, for the same alternator line current. Some exciters, notably salient-pole alternators, do not have the large separation between the short-circuit excitation condition and the rated-load excitation condition. Thus, it is difficult to design current transformers with a ratio low enough to insure that the current boost circuit will be regenerative under short-circuit conditions, and yet with a ratio high enough so that the current fed back will not interfere with the exciter field current supplied by the SCR circuit under normal operating conditions. A static switch, of unique design, is provided to insure compatibility between the SCR circuit and the diode rectifier circuit under normal operation, and yet permit the current feedback to be sufficient to support an exciter short circuit, regardless of the separation between the short circuit and rated-load circuit excitation conditions.

**3,673,489**

## ALTERNATOR AND REGULATOR CONTROL SYSTEM

**James A. Riff, Chicago, Ill., assignor to Motorola, Inc., Franklin Park, Ill.**

**Filed Aug. 5, 1971, Ser. No. 169,431**
**Int. Cl. H02p 9/30**
**U.S. Cl. 322—28** **9 Claims**




An alternator and regulator control system includes diodes connected to the output windings of the alternator to pass unidirectional current pulses and to cause blocking of current when voltage in the output winding reverse biases the diodes. This blockage of current produces a high reverse voltage pulse in the output winding which is then delivered to the field winding of the alternator through electronic switch means to cause excitation of the alternator to develop high power output in the stator windings of the alternator. The electronic switch is a thyristor and forms part of a feedback circuit which is controlled by a voltage regulator that controls the output voltage of the alternator.

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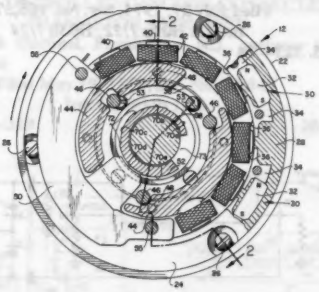
**3,673,490**

## COMBINED ALTERNATOR AND IGNITION TRIGGER SIGNAL GENERATOR WITH ARRANGEMENT FOR SUPPRESSING SPURIOUS TRIGGER SIGNALS

**Robert T. Magrane, Agawam, Mass., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.**

**Filed Sept. 29, 1970, Ser. No. 76,451**
**Int. Cl. H02p 9/40**
**U.S. Cl. 322—50** **12 Claims**



An alternator driven by an internal combustion engine is combined with a trigger signal generator for generator voltage signals used to trigger the breakerless ignition system of the engine. The alternator includes a flywheel having a rim carrying a plurality of main permanent magnets for inducing voltage waveforms in main generating coils located on a stator core positioned adjacent the rotor. The trigger signal generator comprises a triggering magnet and coil assembly located adjacent the path of a flux varying member residing radially inwardly of the path of movement of the main magnets. The production of spurious trigger signals in the trigger coil by the leakage flux of the main magnets is suppressed by both a mag-

netic shunt, physically positioned between the triggering magnet and coil assembly and the path of the main magnets, providing a lower reluctance path for the leakage flux which path bypasses the triggering magnet and coil assembly and by constructing the flux varying member and the triggering magnet and coil assembly in such a form as to cause the induction in the trigger coil of voltage pulses which occur simultaneously with and counteract such spurious signals.

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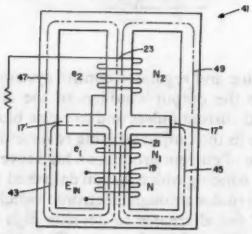
**3,673,491**

## MAGNETIC SQUARE WAVE VOLTAGE GENERATOR

**Orestes M. Baycura, 2238 Central Park Drive, Campbell, Calif.**

**Filed Dec. 21, 1970, Ser. No. 99,872**
**Int. Cl. H01f *35/00, 29/00***
**U.S. Cl. 323—48** **3 Claims**




A magnetic square wave voltage generator comprising at least one core having both a high impedance flux path and a low impedance flux path. An input winding couples each of the high and low impedance flux paths and one output winding couples the high impedance flux path and another output winding couples the low impedance flux path. The two output windings are series connected and when a sinusoidal signal is applied to the input winging it results in a square wave output signal across both series connected output windings.

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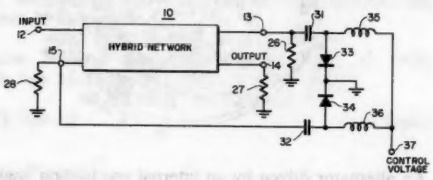
**3,673,492**

## VOLTAGE CONTROLLED HYBRID ATTENUATOR

**Russell A. Gilson, Oakhurst, N.J., assignor to The United States of America as represented by the Secretary of the Army**

**Filed July 27, 1971, Ser. No. 166,377**
**Int. Cl. H01p *1/22*; H03h *7/24***
**U.S. Cl. 323—74** **3 Claims**



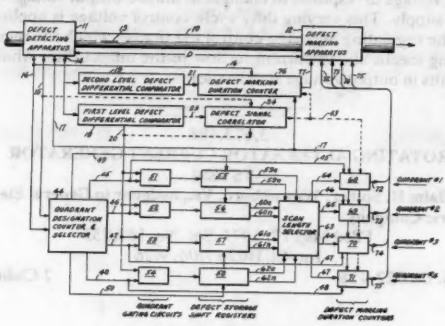

This disclosure relates to attenuators and, particularly, to controllable, constant-impedance attenuators. More particularly, this disclosure describes a voltage or current-controlled absorptive attenuator, using a four terminal hybrid circuit, wherein the amount of power passed from the input terminal to the output terminal can be varied from zero to maximum by controlling the amount of power diverted to the other two, quadrature terminals of the hybrid network.

**3,673,493**

## ONE-PROBE METHOD AND APPARATUS FOR DETECTING, CORRELATING, AND CLASSIFYING DEFECTS IN TEST MEMBERS

**John P. Hoffman, Coopersburg, and Robert C. Booth, Bethlehem, both of Pa., assignors to Bethlehem Steel Corporation**

**Continuation-in-part of Ser. No. 816,762, April 16, 1969, abandoned. This application April 21, 1970, Ser. No. 30,583**
**Int. Cl. G01r *33/12***
**U.S. Cl. 324—37** **23 Claims**




Nondestructive test apparatus detects both straight and skewed defects in test members such as steel bars and billets having either curved or flat surfaces. Detecting means, including a probe adapted to scan a surface of said member cyclically during relative lengthwise movement therewith, produces electrical signals representative of defects detected in said member. Electrical signals cause defect pulses to be produced and these pulses are coordinated with probe position pulses in electronic circuits which classify the defects according to location, or location in combination with level of defect severity and/or length, in a longitudinally extending section of the test member. A signal correlator may be added to reject noise and false defect pulses as well as to accommodate skewed defects when either or both such situations are encountered. The finally processed defect pulses are utilized, for example, to activate reworkable or rejectable defect markers downstream of the probe over a section of the scanned surface where the defects occurred in said member.

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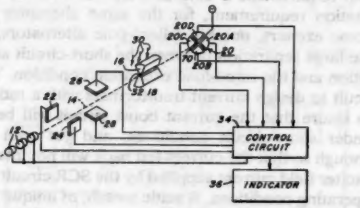
**3,673,494**

## ELECTRON BEAM MAGNETOMETER SENSOR

**Edmund J. Vitek, Glen Burnie, and Robert A. Yeates, Linthicum, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Sept. 30, 1969, Ser. No. 862,376**
**Int. Cl. G01r *33/00, 33/02***
**U.S. Cl. 324—41** **11 Claims**




Described is a device for detecting disturbances in magnetic fields, particularly the magnetic field of the earth, by means of a vacuum tube containing an electron gun which emits an

electron beam and directs it between spaced pole pieces located within the envelope of the vacuum tube itself. The earth's magnetic field surrounding the tube is concentrated at the gap between the pole pieces such that the presence of a magnetically permeable body near the tube will alter the magnetic field intensity across the gap and cause the electron beam to deflect. This deflection is sensed by electrical circuitry to indicate the existence of a disturbance and its magnitude. The invention finds utility, for example, in geophysical exploration and in detecting concealed items of magnetically permeable material, such as concealed guns.

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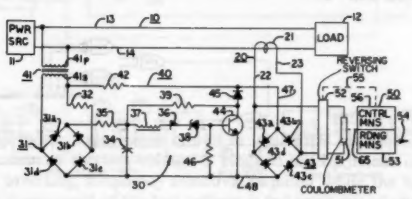
**3,673,495**

## APPARATUS AND METHOD FOR MEASURING ELECTRICAL ENERGY CONSUMPTION

**Richard E. Riebs, Hales Corners, Wis., assignor to McGraw-Edison Company, South Milwaukee, Wis.**

**Filed Feb. 24, 1971, Ser. No. 118,355**
**Int. Cl. G01r *21/00***
**U.S. Cl. 324—142** **20 Claims**




A current transformer is connected to an electrical power circuit to provide a measure of the current in the power circuit. The current measure is applied through a reversing switch and a diode rectifying bridge to a coulombmeter and is controlled by commutating the bridge with a voltage from a voltage transformer connected to the electrical power circuit. The connections are made to apply current to the coulombmeter during the portion of the current cycle that occurs during a selected voltage half cycle. The current measure is further controlled by a modulating circuit connected to respond to the voltage of the power circuit and to pulse modulate the current as a function of voltage level. A control means responds to a selected condition of the coulombmeter to reverse the control current connections to the coulombmeter. A reading means senses the number of reversal operations to thereby provide an indication of the total amount of energy consumed in the power circuit over a selected period.

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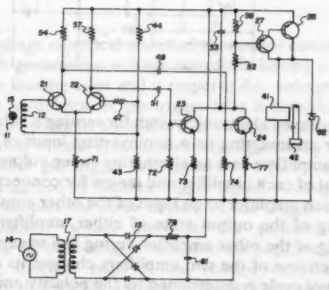
**3,673,496**

## MOTION DETECTING CIRCUIT

**Raymond L. Nelson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed March 19, 1970, Ser. No. 21,113**
**Int. Cl. G01p *3/56***
**U.S. Cl. 324—161** **2 Claims**



A circuit for detecting rotary motion of a shaft (or detecting that the shaft has stopped) includes a tachometer driven by the shaft. The tachometer output is amplified and converted by a transistor circuit so that the resulting signal can be used to operate a relay even when the shaft rotational speed is low. The relay operates suitable indicating or controlling means.

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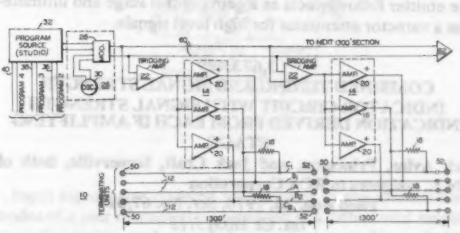
**3,673,497**

## UNDERGROUND RADIO COMMUNICATION SYSTEM FOR ROADWAYS

**John Peter Thrasher, Kensington, Md., assignor to Peter V. Gureckis, Potomac, Md.**

**Filed Oct. 28, 1970, Ser. No. 86,921**
**Int. Cl. H04b *1/04***
**U.S. Cl. 325—180** **5 Claims**




A roadway radio communication system for transmitting radio communication signals to vehicles traveling along a roadway, including airport runways, in which four or more conductor array of communication antennas, parallel oriented longitudinally beneath the road surface and/or ground surface, constitute radiation antenna means, and in which the communication signals are fed to the center and adjacent pairs of wires in out-of-phase relation, and the communication radio signals are applied to the outermost pair of wires in cancelling-phase relation for developing an antenna pattern immediately over the roadway and in which the antenna pattern does not substantially extend over lateral areas beyond the edge of the roadway, and in which the wires constituting the radiation antenna means are of substantial sized conductors measured along their diameter and the conductor is encased in a generally low dielectric constant insulation material of substantial thickness in relation to the diameter of the conductor wire.

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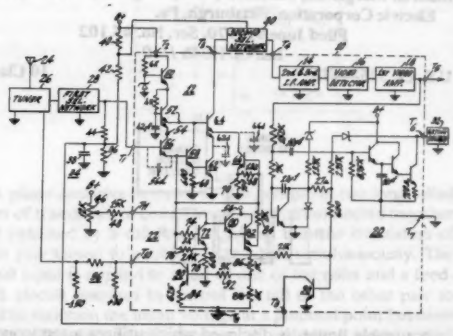
**3,673,498**

## GAIN CONTROLLED CASCODE-CONNECTED TRANSISTOR AMPLIFIER

**Jack Rudolph Harford, Flemington, N.J., assignor to RCA Corporation**

**Filed May 19, 1970, Ser. No. 38,842**
**Int. Cl. H04b *1/16***
**U.S. Cl. 325—319** **20 Claims**




A gain controlled amplifier system suitable for use as an intermediate frequency television amplifier and adapted for

construction in integrated circuit form. A gain controllable cascode amplifier arrangement includes a relatively high maximum gain, common emitter transistor coupled to one emitter of a double emitter, common base output transistor. The arrangement also includes a degenerated common emitter transistor having a smaller collector to substrate capacitance than that of the first common emitter transistor. The degenerated transistor is coupled to the second emitter of the output transistor. AGC and signals are supplied to the two common emitter transistors via an emitter follower. A feedback loop includes the resistor of the follower and is coupled to the inputs of the common emitter transistors to maintain fixed bias thereat upon reception of intermediate level signals and consequent cut off of the first common emitter transistor. The emitter follower acts as a gain control stage and ultimately as a varactor attenuator for high level signals.

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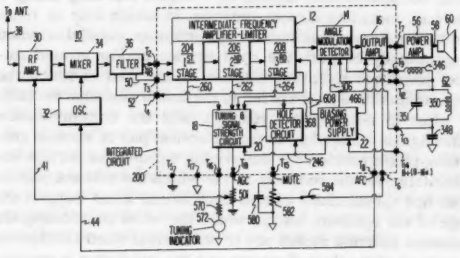
**3,673,499**

## COMBINED TUNING AND SIGNAL STRENGTH INDICATOR CIRCUIT WITH SIGNAL STRENGTH INDICATION DERIVED FROM EACH IF AMPLIFYING STAGE

**Jack Avins, Princeton, and Jack Craft, Somerville, both of N.J., assignors to RCA Corporation**

**Filed Aug. 26, 1970, Ser. No. 67,010**
**Int. Cl. H03j *3/12***
**U.S. Cl. 325—398** **11 Claims**




A tuning and signal strength indicator circuit for FM receivers which enables accurate tuning and signal strength indication on a single indicator for input signal waves ranging from threshold value to receiver overload. Indicator current is obtained by summing contributions from signal waves obtained after the quadrature phase shift network of the detector and several points in the multi-stage amplifier-limiter driving the detector.

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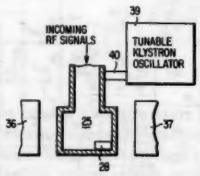
**3,673,500**

## CYCLOTRON RESONANCE FREQUENCY-SELECTIVE LIMITER USING INHOMOGENEOUS RF MAGNETIC FIELD

**Dickron Mergerian, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed June 9, 1970, Ser. No. 45,102**
**Int. Cl. H04b *1/10***
**U.S. Cl. 325—473** **10 Claims**




A tunable limiter is disclosed which utilizes a semiconductor containing an excess of free electrons and having a cyclotron resonance line which is inhomogeneously broadened. The semiconductor is exposed to a static magnetic field and spatially inhomogeous RF electric field at the cyclotron resonance frequency, within a waveguide cavity. The RF electric field is derived from the incoming signal, which contains information as well as possible jamming signals. By virtue of the thermo-electric-cyclotron-resonance effect, power from signals exceeding a saturation level set by the intensity of the RF field causes saturation of the limiter, but only at the frequency of those signals. This provides limiting of intense jamming signals without disturbing information signals at nearby frequencies.

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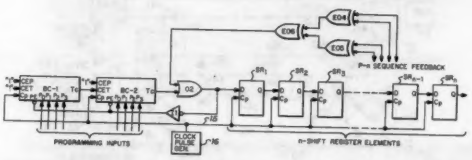
**3,673,501**

## CONTROL LOGIC FOR LINEAR SEQUENCE GENERATORS AND RING COUNTERS

**David L. Zeph, Indianapolis, Ind., assignor to The United States of America as represented by the Secretary of the Navy**

**Filed Aug. 18, 1971, Ser. No. 172,809**
**Int. Cl. G11c *19/00*; H03k *21/00, 21/34***
**U.S. Cl. 328—37** **9 Claims**




A control logic for linear sequence generators and ring counters to prevent "latch-up" in the "0" state having a linear sequence generator including a shift register with modulo-2 exclusive-OR feedback from the shift register to the shift register input and feedback through binary counters to detect and count $n-1$ consecutive "0"'s in the shift register to feed a "1" into the shift register to prevent "0" state latch, where $n$ is the number of shift register stages used.

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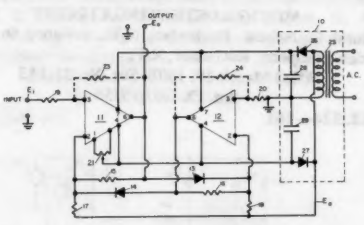
**3,673,502**

## VOLTAGE SENSING SWITCH

**Charles Gardner Swain, Arlington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.**

**Filed May 10, 1971, Ser. No. 141,810**
**Int. Cl. H03k *5/20***
**U.S. Cl. 328—146** **8 Claims**

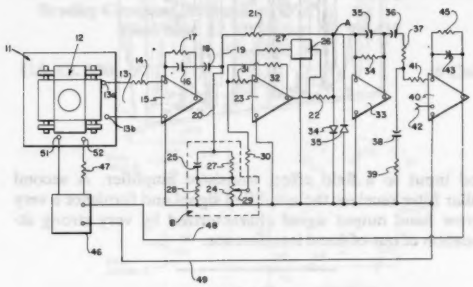



An improved electronic switch for sensing a voltage applied to either an inverting or a noninverting input of one of two voltage amplifiers uses an alternating sweep voltage applied to one input of each amplifier and means for connecting the output of each amplifier to an input of the other amplifier so that switching of the output state of either amplifier suppresses switching of the other amplifier during any sweep voltage cycle; which one of the two amplifiers changes its output state during any cycle is determined by the polarity and magnitude of the voltage being sensed after a nearly constant time within each cycle.

## 3,673,503
## HARMONIC SUPPRESSION CIRCUIT

Harold F. Parker, Lee, Mass., assignor to General Electric Company

Filed July 6, 1971, Ser. No. 160,034
Int. Cl. H03b 1/04
U.S. Cl. 328—167 3 Claims

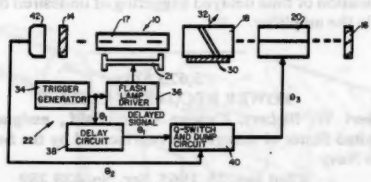


A harmonic suppression circuit in which the fundamental component of the test voltage is blocked out by means of a phase inverting, frequency selective amplifier while the harmonic component of the test voltage is fed back out of phase with the normally generated harmonic component of the test voltage.

## 3,673,504
## LASER WITH COMBINED Q-SWITCH AND SYNCHRONIZED CAVITY DUMP CIRCUIT

Ronald P. Hilberg, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 686,076, Nov. 28, 1967, Pat. No. 3,577,097. This application Dec. 23, 1969, Ser. No. 889,823
Int. Cl. H01j 17/02
U.S. Cl. 328—210 6 Claims

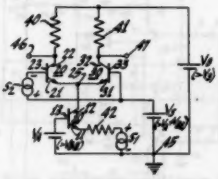



A high voltage electrical waveform generator circuit is provided which generates a voltage waveform having a positive d.c. voltage leading edge and a negative d.c. voltage trailing edge to the modulator. A gas trigger tube is provided in the circuit which generates a positive d.c. voltage leading edge in its plate circuit when it is independently triggered by a trigger signal. Another gas trigger tube generates a positive voltage when it is triggered by another trigger signal. A coupling circuit which couples the plate circuits of the trigger tubes includes capacitor which converts the positive voltage generated by the other trigger tube into the negative d.c. voltage trailing therefor edge of the voltage waveform. The coupling circuit may also include differentiator which allows the voltage levels on the trigger tube plates to be independently varied without affecting each other.

## 3,673,505
## SYNCHRONOUS DEMODULATOR EMPLOYING A COMMON-BASE TRANSISTOR AMPLIFIER

Allen LeRoy Limberg, Somerville, N.J., assignor to RCA Corporation

Filed Nov. 13, 1970, Ser. No. 89,273
Int. Cl. H03d 3/18
U.S. Cl. 329—50 6 Claims

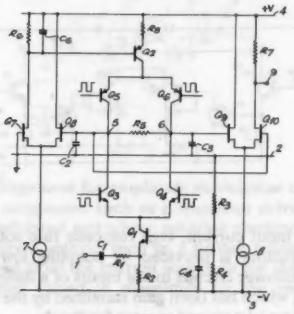


Input signals are coupled in common to the emitter electrodes of a pair of transistors arranged in a differential amplifier configuration, and are synchronously detected by switching signals coupled to the respective transistor base electrodes. The coupling to the emitter electrodes is through a transistor arranged in a common-base amplifier construction, with the signals to be demodulated being applied to the amplifier transistor emitter electrode via an included stabilizing resistor.

## 3,673,506
## ELECTRONIC PHASE SENSITIVE DETECTOR CIRCUITS

Eric Andrew Faulkner, Reading, England, assignor to Brookdeal Electronics Limited, Bracknell, England

Filed Feb. 16, 1971, Ser. No. 115,524
Claims priority, application Great Britain, March 11, 1970, 11,589/70
Int. Cl. H03d 1/18
U.S. Cl. 329—103 4 Claims

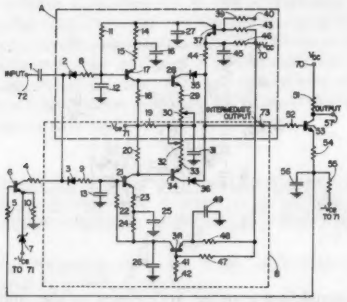


A phase-sensitive detector circuit comprises two long-tailed pairs of transistors of complementary type connected together and switched by a reference signal so that the transistors of each pair joined to each other conduct simultaneously. The signal input is applied to a tail of one of the pairs and a feedback circuit operates to control the tail of the other pair to tend to maintain the mean voltage at a junction point between the two pairs at a constant value. A resistance is connected across the junctions between the pairs and the output is taken differentially from the junctions.

### 3,673,507
### TWO CHANNEL READ AMPLIFIER

Robert S. Prescott, Lexington, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed April 29, 1970, Ser. No. 33,029
Int. Cl. H03f 3/68
U.S. Cl. 330—30 R 18 Claims



Two amplification channels for use with a read-head of a tape transport device of a computer system comprised of transistors, and associated diodes, resistors and capacitors, are each independently set for optimum response to one of two modes of information stored on a magnetic medium. Electronic switching means are provided for activating one channel or the other in accordance with the type of signal being read. The operating points of the two amplification channels are stabilized by a common biasing means.

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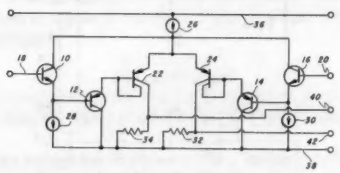
### 3,673,508
### SOLID STATE OPERATIONAL AMPLIFIER

Michael J. Callahan, Jr., Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 10, 1970, Ser. No. 62,461
Int. Cl. H03f 3/68
U.S. Cl. 330—30 D 12 Claims



A low input current, high response rate solid state operational amplifier is provided by coupling low input current emitter follower circuits to the inputs of a differential amplifier circuit which has been gain stabilized by the use of multiple collector transistors and current feedback.

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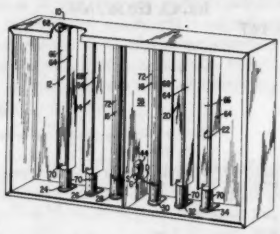
### 3,673,509
### INTERDIGITAL PREAMPLIFIER

Robert B. Cooper, Jr., Oklahoma City, Okla., assignor to Edwin J. Sossen, Oklahoma City, Okla., a part interest

Filed Aug. 7, 1970, Ser. No. 62,056
Int. Cl. H03f 3/04
U.S. Cl. 330—31 8 Claims

A bandpass preamplifier for isolating a narrow frequency band, especially in the VHF or UHF range, from interference or out-of-band radiation generated by high energy transmitters operating at frequencies near the desired band. The circuit includes a first turnable combline bandpass filter, employing strip line inductive elements, which provides a narrow



band input to a field effect transistor amplifier. A second similar filter receives the amplified signal and furnishes a very narrow band output signal characterized by very strong attenuation of out-of-band interference.

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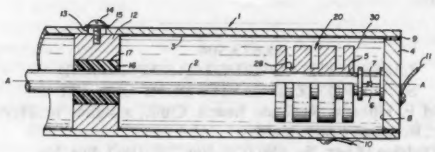
### 3,673,510
### BROAD BAND HIGH EFFICIENCY AMPLIFIER

Martin I. Grace, Framingham, and Harold J. Pratt, Jr., Andover, both of Mass., assignors to Sperry Rand Corporation

Filed Oct. 7, 1970, Ser. No. 78,720
Int. Cl. H03f 3/10
U.S. Cl. 330—34 10 Claims



An active high-efficiency-mode semiconductor device is coupled to oscillating high frequency fields in a transmission line network for amplifying those electromagnetic fields, the apparatus taking the form of a single port high frequency device. The transmission line network provides means for elimination of time delayed triggering of undesired oscillations within the amplifier.

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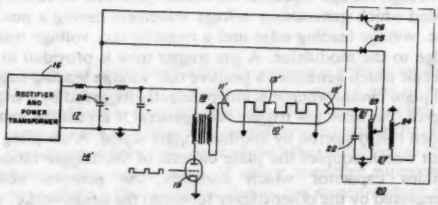
### 3,673,511
### POWER RECOVERY CIRCUIT

Herbert W. Bickert, Canoga Park, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 25, 1965, Ser. No. 428,289
Int. Cl. H03f 3/54
U.S. Cl. 330—44 10 Claims




A power recovery circuit for use with an electron beam tube having a resonant circuit containing a capacitor in parallel

with an inductive element connected to the collector of the tube. A unidirectional conducting circuit connected between the inductive element and the power supply, which supplied energy to the cathode of the tube, feeds energy back to the power supply.

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**3,673,512**

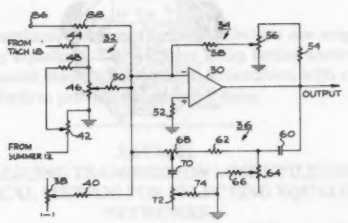
**SERVO AMPLIFIER**

**Ronnie G. Walters, Mayfield Heights, Ohio, assignor to Allen-Bradley Company, Milwaukee, Wis.**

**Filed Sept. 22, 1970, Ser. No. 74,427**

**Int. Cl. H03f 1/36**

**U.S. Cl. 330—97** **6 Claims**




A servo amplifier is provided with associated circuitry which affords substantially independent compensation of both its frequency response and gain over the usable bandwidth whereby in a servo loop lead-lag compensation can be provided to establish desired output characteristics for the servo loop.

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**3,673,513**

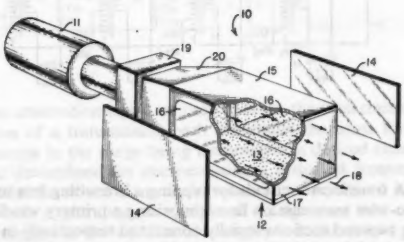
**ELECTRON BEAM-INITIATED CHEMICAL LASER SYSTEMS**

**David W. Gregg, Lafayette; Ray E. Kidder, Pleasanton, and Barton Krawetz, Livermore, all of Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission**

**Filed May 26, 1970, Ser. No. 40,652**

**Int. Cl. H01s 3/22, 3/09**

**U.S. Cl. 331—94.5** **12 Claims**



An electron beam-initiated volumetrically ignited chemical laser system wherein a short, high energy charged particle pulse directed through an explosive gaseous mixture within an optical cavity uniformly ignites the explosive mixture in the optical cavity. The energy released in the conflagration creates a large population inversion in lasing energy states of transient and resulting chemical species. Volumetric ignition is distinguished from point ignition in that with point ignition a large volume of material is consumed via the propagation of a macroscopic burn or slow front whereas no such macroscopic front occurs for volumetric ignition. The electron beam provides a means to obtain "multipoint" ignition throughout the volume of material.

**3,673,514**

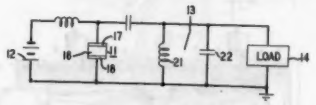
**SCHOTTKY BARRIER TRANSIT TIME NEGATIVE RESISTANCE DIODE CIRCUITS**

**Donald James Coleman, Jr., Warren, and Simon Min Sze, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.**

**Filed Dec. 31, 1970, Ser. No. 103,253**

**Int. Cl. H01l 3/00; H03b 7/14; H03f 3/10**

**U.S. Cl. 331—107 R** **7 Claims**




In a preferred form, a negative resistance diode comprises a semiconductor wafer contained between two Schottky barrier contacts. The diode is biased below avalanche breakdown, but above a critical "reach-through" voltage, which, with appropriate diode parameters and an appropriate external circuit, causes minority carriers to be injected by the forward-biased contact to give a transit time negative resistance. When used as an oscillator, the device gives a significantly lower noise figure than analogous Impatt diodes. Amplifier and voltage limiter embodiments are also described.

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**3,673,515**

**EMITTER ELECTRODE CURRENT CONTROLLED AMPLITUDE MODULATOR**

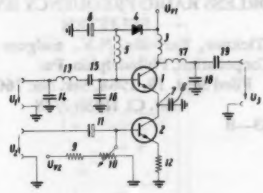
**Karl-Heinz Kersten, and Wolfgang Patschan, both of Heilbronn, Germany, assignors to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm/Danube, Germany**

**Filed Nov. 25, 1969, Ser. No. 879,859**

**Claims priority, application Germany, Nov. 30, 1968, P 18 11 943.2**

**Int. Cl. H03c 1/06**

**U.S. Cl. 332—31 T** **11 Claims**



A circuit arrangement for amplitude modulation comprises a controllable component such as a transistor driven by the signal to be modulated and whose emitting electrode is connected to a current source, such as a further transistor, the current delivered from the current source to the controllable component being varied in magnitude by the modulation signal.

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**3,673,516**

**CONTINUOUS PHASE SHIFTER/RESOLVER EMPLOYING A ROTARY HALFWAVE PLATE**

**William M. Spanos, Wayne, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.**

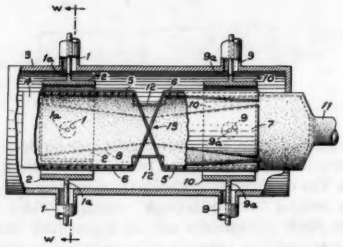
**Filed Feb. 8, 1971, Ser. No. 113,532**

**Int. Cl. H01p 1/18, 3/04**

**U.S. Cl. 333—5** **19 Claims**

A rotary coaxial phase shifter/resolver providing continuous low-loss phase shift or signal resolving capability over a broad band or frequencies. A rotatable balanced coaxial halfwave

plate is capacitively coupled between balanced input and output dual orthogonally polarized coaxial launchers, which launchers are in turn coupled to respectively input and output feed arrangements appropriate to the particular mode of operation. The input and output launchers each consist of a stationary balanced stator having a plurality of concentrically arranged capacitive plates to permit excitation of duel orthogonal coaxial balanced line modes and a balanced rotor having a plurality of capacitive plates in one-to-one correspondence with and concentrically arranged inside the stator plates about the same axis for coupling and transferring the signals in the two orthogonally polarized modes. The halfwave plate includes a pair of orthogonal balanced transmission lines, the conductors of one of which are reversed to provide a 180° phase reversal between the input and output launchers for one of the orthogonally excited electric field components. The relative phase/polarization shift derived from input launcher to output launcher is in a two-to-one correspondence with the physical angle of rotation of the halfwave plate.



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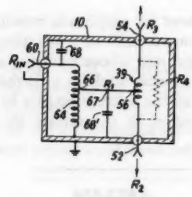
**3,673,517**

**RESISTORLESS RADIO FREQUENCY HYBRID SIGNAL SPLITTER**

**Sergei L. Ticknor, Earlville, N.Y., assignor to Jerrold Electronics Corporation, Philadelphia, Pa.**

**Filed Sept. 19, 1968, Ser. No. 760,751**
**Int. Cl. H03h 7/48**
**U.S. Cl. 333—8** **8 Claims**



A radio frequency signal splitter is described wherein a hybrid coil utilizes a ferrite core whose RF resistance is selected bearing predetermined ratios to the characteristic impedances of the RF input and RF output lines. Several embodiments are described.

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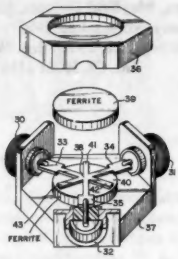
**3,673,518**

**STUB TUNED CIRCULATOR**

**Kenneth L. Carr, Bedford, Mass., assignor to Ferrotec, Inc.**

**Continuation of Ser. No. 468,844, July 1, 1965, abandoned. This application March 10, 1971, Ser. No. 122,977**
**Int. Cl. H01p 1/32, 5/12**
**U.S. Cl. 333—1.1** **19 Claims**




A strip line Y-junction ferrite circulator is tuned by locating a stub at the junction between a pair of arms. Each stub acts to adjust the impedance presented at the input arm.

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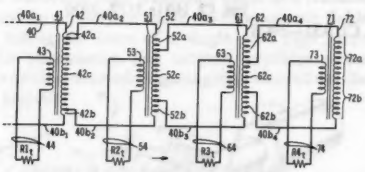
**3,673,519**

**IMPEDANCE MATCHING TRANSFORMER FOR COUPLING TRANSMISSION LINES**

**Gilbert August Van Dine, Winfield Twp., Du Page County, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.**

**Filed Jan. 22, 1971, Ser. No. 108,803**
**Int. Cl. H03h 7/38, 7/48**
**U.S. Cl. 333—6** **13 Claims**



A transformer circuit for tapping a branching line to a main two-wire transmission line comprising a primary winding having two end sections serially connected respectively in the two wires of the main line and a midsection connected across it. The secondary winding originates the branching line and is coupled to the entire primary winding.

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**3,673,520**

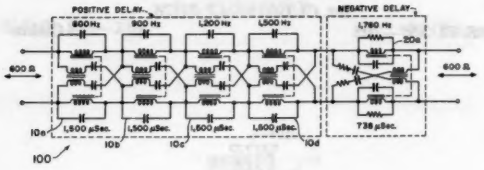
**DELAY EQUALIZER NETWORK INCLUDING NEGATIVE DELAY CIRCUITS**

**Roland C. Taylor, 60 Hudson St., New York, N.Y.**

**Continuation-in-part of Ser. No. 803,661, March 3, 1969, abandoned. This application Dec. 14, 1970, Ser. No. 97,613**
**Int. Cl. H03h 7/04**
**U.S. Cl. 333—28 R** **6 Claims**

An equalizer circuit for equalizing delay in the passband of signals in a transmission line employs both positive and negative delay equalizer sections. By use of negative delay which

subtracts from the delay in the line, uniform delay of lower time magnitude is obtainable than by use of positive delay circuits alone. Also, by using one or more negative delay sections a given equalization envelope is obtainable employing fewer




equalizer sections. Lattice or bridge-T circuits are employed in the delay equalizer. The negative delay lattice sections include resistance elements selected in accordance with criteria herein set forth to provide the negative delay.

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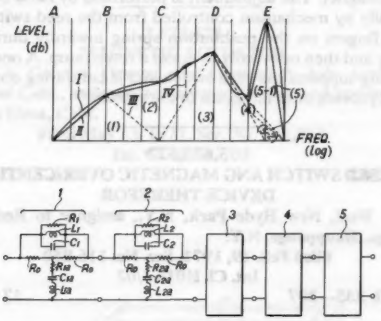
**3,673,521**

## EQUALIZING TRANSMISSION LOSS UTILIZING GRAPHICAL METHOD FOR SELECTING EQUALIZER NETWORKS

**Hiroshi Yuguchi, Yokohama, Japan, assignor to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo-to, Japan**

**Filed Jan. 11, 1971, Ser. No. 105,479**
**Claims priority, application Japan, Jan. 14, 1970, 45/3729**
**Int. Cl. H03h 7/14; H04b 3/14**
**U.S. Cl. 333—28 R** **2 Claims**




In an attenuation equalizer used to make the total transmission loss of a transmission path essentially the same for all frequencies in the range being transmitted, a desired characteristic determined for compensating a distorted frequency characteristic of the transmission path to be equalized is divided into a plurality of equilateral triangles so that each characteristic of the equilateral triangles is realized by a unit circuit, such as a constant resistance circuit of second degree function type.

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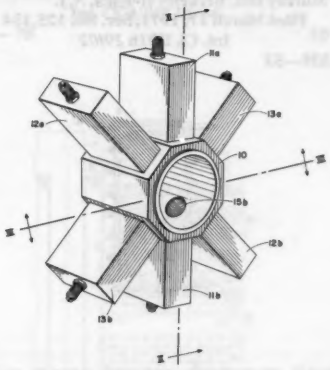
**3,673,522**

## MICROWAVE BALANCED EXTERNAL CAVITY REJECTION FILTER

**Arvid Ramkrishnarao Bastikar, Kanata, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada**

**Filed April 5, 1971, Ser. No. 131,280**
**Int. Cl. H03h 7/10, 9/00**
**U.S. Cl. 333—73 W** **2 Claims**

In an axially symmetrical waveguide, a balanced external cavity filter comprising a plurality of resonant cavity pairs coupled to the waveguide and disposed on the circumference of the same in a plane orthogonal to its axis, constitutes a novel mode-filter rejecting undesired polarizations in certain waveguide propagation-modes determined by the angular




positions of the cavity pairs and their coupling to the waveguide at frequencies at which the cavity pairs are resonant.

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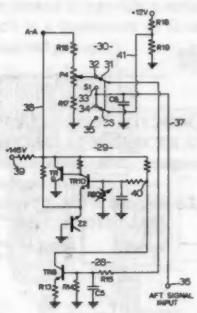
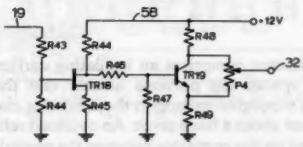
**3,673,523**

## SIGNAL TRANSLATING NETWORKS AND CONTROL CIRCUITS FOR THE TUNERS OF SIGNAL RECEIVERS

**William G. Russell, Kitchener, Ontario, Canada, assignor to Electrohome Limited, Kitchener, Ontario, Calif.**

**Filed Oct. 5, 1970, Ser. No. 78,027**
**Int. Cl. H03j 3/06**
**U.S. Cl. 334—15** **7 Claims**



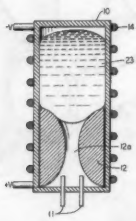




A signal receiver of a type employing a varactor tuner is provided with a network that compensates for the different sensitivities of different ones of the channels to which the receiver can be tuned and that also provides manual fine tuning.

## 3,673,524
## PISTON MERCURY SWITCH

Terrell Nicholson Lowry, Genoa Township, Delaware County, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed March 17, 1971, Ser. No. 125,184
Int. Cl. H01h 29/02
U.S. Cl. 335—52 6 Claims

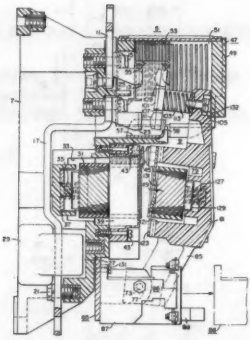


A bistable magnetically operated mercury switch is disclosed which comprises a magnetic piston contained in a hermetically sealed chamber along with a globule of mercury. As the piston is moved from one end of the chamber to the other end under the influence of an external magnetic field, the mercury is displaced through an aperture in the spindle to the opposite end of the chamber where it electrically connects terminals.

## 3,673,525
## CONTACTOR

James D. Collins, Buffalo, and Thomas A. Wilsdon, Alden, both of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed March 30, 1971, Ser. No. 129,473
Int. Cl. H01h 51/06
U.S. Cl. 335—132 9 Claims

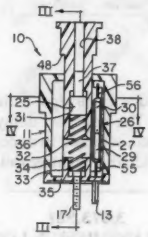


A contactor comprises an insulating carrier comprising a pair of spaced leg portions at one end thereof that are pivotally supported to support the insulating carrier for pivotal movement about a fixed pivot. An overload relay is removably supported on the contactor between the spaced leg portions of the insulating carrier. The insulating carrier supports a movable contact structure and a magnetic armature to provide a movable structure movable between open and closed positions. Opening movement of the movable structure is limited by engagement of the movable structure with stop means on a removable arc hood structure. When the arc hood structure is removed the movable structure can be moved past the open position to a maintenance position.

## 3,673,526
## MAGNETIC SWITCHES AND METHOD AND APPARATUS FOR MAKING SAME

Arnold Aage Brevick, Roselle, Ill., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed Nov. 23, 1970, Ser. No. 91,712
Int. Cl. H01h 3/12, 51/28
U.S. Cl. 335—205 17 Claims

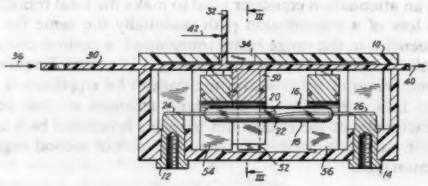


Pushbutton switch in which a coiled return spring holds a magnet in a socket of a pushbutton and against a roll pin which is accessible after assembly for slidable adjustment to fix the position of the pushbutton at which the magnet actuates a reed switch positioned alongside the path of movement of the magnet. The adjustment is performed by hand or automatically by mechanism controlled from the reed switch. Integral fingers on the pushbutton spring inwardly during assembly and then outwardly to act as a return stop. A one piece stamping supports the reed switch and is cut during construction to provide both terminals of the switch.

## 3,673,527
## REED SWITCH ANG MAGNETIC OVER-CENTER DEVICE THEREFOR

Edgar Wolf, New Hyde Park, N.Y., assignor to Redactron Corp., Hauppauge, N.Y.

Filed Feb. 19, 1971, Ser. No. 116,850
Int. Cl. H01h 5/02
U.S. Cl. 335—207 12 Claims



A reed switch which is magnetically actuated is provided with a magnetic arrangement which affords an over-center feel or force gradient or curve. The arrangement includes oppositely polarized and spaced magnets between which is located a further magnet which directly operates the reed switch or which is connected to another magnet which operates the switch.

## 3,673,528
## WIDE FREQUENCY RESPONSE LINE SCAN MAGNETIC DEFLECTOR

William C. Hughes, Scotia, N.Y., assignor to General Electric Company

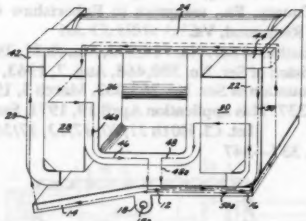
Filed March 1, 1971, Ser. No. 119,584
Int. Cl. H01f 7/00
U.S. Cl. 335—210 10 Claims

A magnetic deflector for an electron beam is disclosed. The deflector is characterized by a frequency response of several megahertz and a linear deflection. The wide frequency response and linearity are achieved by utilizing particularly shaped pole pieces within the electron beam gun. In additional embodiments, combinations of deflecting elements are disclosed.

## 3,673,529
## MAGNETIC ACTUATOR

Joseph A. Garratt, Orange, and Leonard P. Ash, Anaheim, both of Calif., assignors to Babcock Electronics Corporation, Costa Mesa, Calif.

Filed May 13, 1971, Ser. No. 142,883
Int. Cl. H01f 7/08
U.S. Cl. 335—234 12 Claims

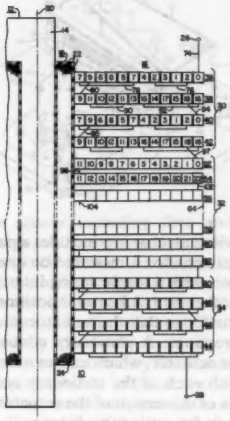


A magnetic actuator, such as is frequently used to control the operation of electrical contacts of electromagnetic relays. The actuator has a pair of permanent magnets which retain a symmetrically-shaped armature in either of two alternative operating positions. An electromagnet is employed to aid the magnetic flux of one of the permanent magnets and to counteract the magnetic flux of the other in determining the position of the bi-stable armature. A common piece or pole is provided for the several permanent magnet circuits, which pole piece can be adjusted with respect to the armature with equal effect upon the flux flow therein.

## 3,673,530
## ELECTRICAL WINDINGS

Robert I. Van Nice, Sharon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 8, 1970, Ser. No. 96,010
Int. Cl. H01f 15/14
U.S. Cl. 336—70 10 Claims

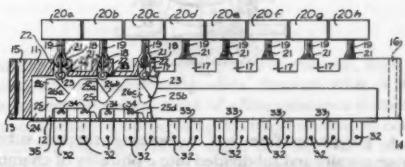


A winding for electrical inductive apparatus, having a plurality of axially spaced, serially connected pancake coils. A first group of pancake coils at one end of the winding are of the interleaved turn type, and a second group of pancake coils, connected to the first group, are of the continuous type. The degree of interleaving of the first group, and the radial spacing between the conductor turns of each pancake coil of the first group, are selected to provide a series capacitance for the first group which is a maximum of four times the series capacitance of the second group.

## 3,673,531
## ELECTRICALLY RELEASED LATCHING SWITCH FOR TIMER-CONTROLLED APPLIANCES AND THE LIKE

Victor H. Zane, Connersville, Ind., assignor to Design and Manufacturing Corporation

Filed Aug. 13, 1970, Ser. No. 63,488
Int. Cl. H01h 61/02
U.S. Cl. 337—77 6 Claims

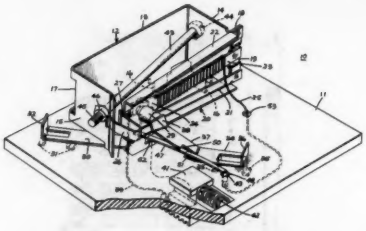


Switch means, movable between an "OFF" and an "ON" position. Latch means are provided in association with the switch means for holding the switch means in its "ON" position. The latch means is responsive to an electrical signal from an external source to release the switch means for return to its "OFF" position.

## 3,673,532
## THERMAL SWITCH MECHANISM

Ralph H. Allison, Jr., Morrison, Ill., assignor to General Electric Company

Filed Dec. 30, 1970, Ser. No. 102,650
Int. Cl. H01h 61/02
U.S. Cl. 337—102 7 Claims

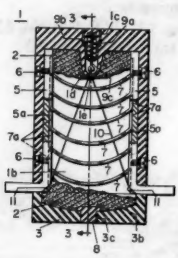


A thermal switch mechanism includes a pair of spaced apart arms. A thermal actuator is mounted on one arm and extends toward the other, with a toggle spring interconnecting the actuator and the other arm. A heater is positioned for selectively heating the actuator so that the actuator selectively will move in opposite directions. A stationary contact is provided on each side of the actuator, which carries a movable contact for engagement with each of the stationary contacts, depending on the direction of movement of the actuator. A screw extends between the arms for setting the distance therebetween to adjust the switch differential. An insulator is normally positioned between the movable contact and one of the stationary contacts and is movable therefrom. A second, normally open switch is interconnected with the insulator. When the insulator is moved from between the movable contact and one of the stationary contacts, the normally open switch is closed.

## 3,673,533
## ELECTRIC LOW-VOLTAGE FUSE HAVING TERMINAL BARS

Erwin Salzer, Waban, Mass., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed Aug. 17, 1971, Ser. No. 172,470
Int. Cl. H01h 85/08, 85/12, 85/20
U.S. Cl. 337—161 5 Claims

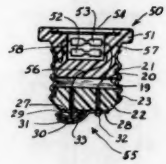


A polyphase fuse has a housing shaped substantially prismatically and subdivided into a plurality of chambers each provided for a phase fuse unit, or pole fuse unit, of the polyphase fuse. Each of the chambers contains a pair of terminal bars spaced by the housing itself so as to dispense with additional insulating spacers arranged between each pair of terminal bars. The juxtaposed surfaces of each pair of terminal bars are provided with fuse-link-receiving grooves. Each fuse link means includes a groove-engaging spacing tab and a substantially C-shaped center portion positioned generally transversely to the pair of terminal bars. The fuse link means of each phase unit of the polyphase fuse are superimposed and form a stack, the spacing between the contiguous C-shaped center portions thereof being determined by the length of their spacing tabs.

## 3,673,534
## DOUBLE LIFE LIGHT BULBS, FUSES, AND THE LIKE

Robert C. Marinace, 2440 Valentine Ave., New York, N.Y.

Filed May 4, 1971, Ser. No. 140,194
Int. Cl. H01h 85/20; H01k 1/64, 9/04
U.S. Cl. 337—258 13 Claims

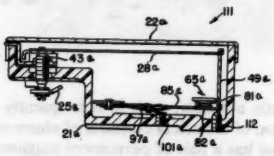


Double life light bulbs, fuses, and the like comprising a plurality of conducting filaments arranged in parallel having a common lead and a base comprising a hollow threaded member electrically connected to the common lead; an insulating member with open channels extending therethrough disposed in the lower end of said threaded member; a plurality of conducting members, each having an end connected, respectively, to one of the conducting filaments and the other end extending through the insulating member; and two contact members of ductile, conductive material, said contacts being bent through a 90° angle and being mounted on the exterior of the insulated section of said threaded member with the lines of fold of the respective contact members lying adjacent to one another, the vertically projecting sections of the contacts laminated together in an insulated relationship, the mounted section of the contacts having openings therein for receiving the respective conducting members; the insulated laminate structure being capable of being folded through 180° to expose, alternately, each of the available contacts.

## 3,673,535
## ELECTRICAL SWITCH HAVING A SNAP BLADE MEANS AND METHOD OF CALIBRATING THE SAME OR THE LIKE

David M. Rosenberg, and Siegfried E. Manecke, both of Indiana County, Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 714,992, March 21, 1961, which is a division of Ser. No. 300,468, Aug. 7, 1963, which is a continuation of Ser. No. 263,033, March 5, 1963, Pat. No. 3,238,337. This application April 19, 1971, Ser. No. 135,419
Int. Cl. H01h 11/00, 37/12, 37/26
U.S. Cl. 337—347 12 Claims



An electrical switch having a snap blade means of the over-center variety that is confined in its movement to only the negative rate area thereof on one side of its over-center position and to a method for calibrating such an electrical switch by simple adjustments of an adjusting member engaging the snap blade means and an adjustable stop means that limits

movement of the snap blade means relative to a fixed contact that cooperates with the blade means and is spaced from the stop means.

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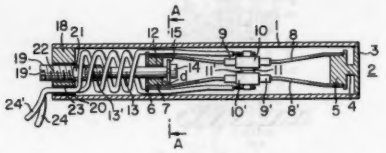
**3,673,536**
**THERMOSTAT SWITCH**

**Kenshi Kondo, No 3-5, Ohkura 1-chome, Setagaya-ku, Tokyo, Japan**

**Filed Nov. 30, 1970, Ser. No. 93,588**
**Int. Cl. H01h** *37/20, 37/48*
**U.S. Cl. 337—392** **3 Claims**



Thermostat switch with metallic, flexible, contact-point plates positioned longitudinally within a thermosensitive sleeve. The two flexible plates are coupled at one end thereof, through a support, to one end of the sleeve and at the opposite end thereof, through another support and a screw rod, to the other end of the sleeve. With a temperature change, the sleeve expands or contracts more than the flexible plates, thereby causing these plates to flex closer to, or away from, each other and thus make or break the thermo-contact. The first mentioned support support has a reduced diameter section which minimizes the delay in thermostatic response to temperature changes. Means for preventing the flexible plates from distorting and for keeping the sleeve moisture-tight are included.

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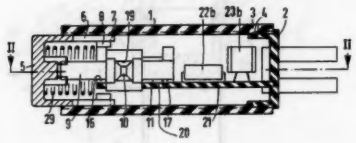
**3,673,537**
**CONTACTLESS SWITCHING DEVICE**

**Karl Greger, Amberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany**

**Filed Sept. 22, 1970, Ser. No. 74,335**
**Claims priority, application Germany, Sept. 23, 1969, P 19 48 027.4**
**Int. Cl. H01c** *1/12*
**U.S. Cl. 338—12** **3 Claims**

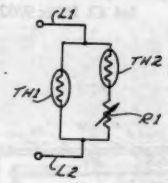


A galvanomagnetic resistor is fixedly mounted on a magnetizable yoke structure. A displaceable actuator comprises a permanent magnet having a longitudinal axis and being rotatably mounted in the yoke structure at a part of the yoke structure opposite that at which the galvanomagnetic resistor is mounted. The actuator has a direction of travel substantially transverse to the longitudinal axis of the magnet.

**3,673,538**
**COMPOSITE THERMISTOR TEMPERATURE SENSOR HAVING STEP-FUNCTION RESPONSE**

**Robert C. Faxon, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Dec. 5, 1969, Ser. No. 882,799**
**Int. Cl. H01c** *7/02*
**U.S. Cl. 338—25** **7 Claims**




A temperature sensor including first and second PTC thermistor elements each having a well-defined transition temperature above which the resistance of the element rises relatively abruptly and below which it changes relatively little, the transition temperature of the second element being substantially greater than that of the first element. The thermistor elements are substantially identically thermally responsive to a body whose temperature is sensed by the sensor. The elements are electrically interconnected to cause the sensor resistance to be an equivalent resistance which varies as a function of the resistance of the elements and changes relatively abruptly at temperatures determined by the transition temperatures of the elements thereby providing the sensor with a step-function R vs. T characteristic.

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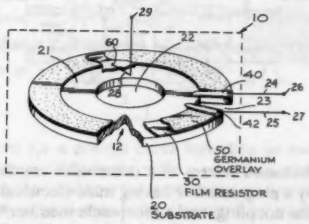
**3,673,539**
**ELECTRICAL RESISTANCE ELEMENT WITH A SEMICONDUCTOR OVERLAY**

**Robert M. Healy, Warrenville, Ill., and Robert Marshall, Meguon, Wis., assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.**

**Filed May 11, 1970, Ser. No. 36,047**
**Int. Cl. H01c** *9/02*
**U.S. Cl. 338—154** **6 Claims**




A thin film overlay of a semi-conductive material, such as germanium, silicon, indium antimonide, titanium oxide or ferric oxide, covers the resistor track of a film resistance element. A resistance element incorporating this improvement, as compared with one having a noble metal overlay, has a much lower temperature coefficient of resistance. A germanium overlay may be provided by evacuating the space about the resistive element to a pressure of about $2\times10^{-6}$ torr, supplying the germanium material in granular particles ranging in fineness between 180–320 mesh by vibration and gravity in a steady and even flow thereof to the evacuated space at a point with respect to which the resistor track is exposed, and then evaporating the germanium at the point by electrical resistance heating to vaporization temperature at about 1,850° C.

When used in a potentiometer with a movable contact, a resistance element so made exhibits superior wear stability, and good contact resistance variation characteristics.

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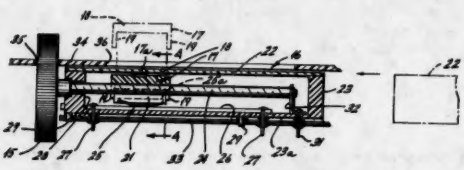
### 3,673,540
### INDICATING DEVICE FOR TUNING APPARATUS

**Robert M. McDonough, Philadelphia, Pa., assignor to Philco-Ford Corporation, Philadelphia, Pa.**

**Filed Jan. 26, 1971, Ser. No. 109,826**
**Int. Cl. H01c *9/02***
**U.S. Cl. 338—196** **4 Claims**



A lead screw operated potentiometer used in a VVC tuning system for a television receiver is provided with a station indicator driven by the tracking arm of the potentiometer, and visible through a transparent dust cover that is snapped-over the potentiometer body.

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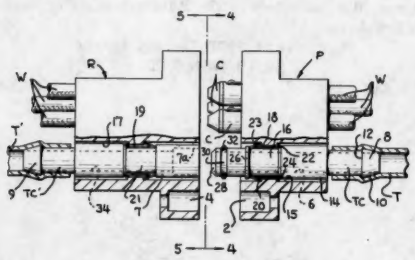
### 3,673,541
### COMPOSITE ELECTRICAL AND FLUID OR AIR CONNECTOR

**Robert Volinskie, Hershey, Pa., assignor to AMP Incorporated, Harrisburg, Pa.**

**Continuation of Ser. No. 732,424, May 5, 1968, abandoned.**
**This application Aug. 6, 1970, Ser. No. 61,788**
**Int. Cl. H01r *13/52***
**U.S. Cl. 339—16 R** **3 Claims**



This disclosure relates to a detachable connector which is defined by a plug member having male electrical contacts and a male tube coupling, and a receptacle member having female electrical contacts and a female tube coupling. The male contacts and coupling are keyed relative to the female contacts and coupling. The tube coupling is sealed against leakage when a connection is effected.

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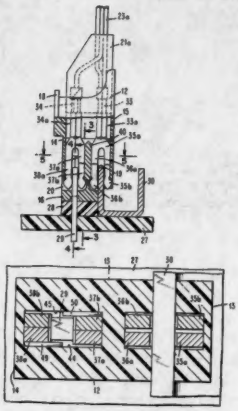
### 3,673,542
### CONNECTOR ASSEMBLY WITH TINE SKEWING HOUSING

**Edmund J. Di Stefano, and Arthur E. Enderley, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed June 17, 1970, Ser. No. 47,073**
**Int. Cl. H01r *3/06***
**U.S. Cl. 339—14 R** **7 Claims**

A new connector assembly provides improved electrical and mechanical contact between a pin of a circuit board and two connector forks that form part of the connector assembly. The assembly includes a plastic housing in which the tines of the two connector forks are skewed so that one of the two tines of each fork makes substantially full contact with one of two opposite sides of the pin and the other tine makes a cooperating partial contact on the other side. In the preferred connector assembly, the housing has two projections that each



extend along one of two diagonally opposite edges of the pin and along the adjacent non-contact making sides of the pin so that the tines nearest the projections are held in substantially full contact with the pin. The other two tines are allowed to extend somewhat beyond the other edges of the pin. The housing is also able to hold a single contact fork. A single unskewed contact fork is approximately centered on the pin between the diagonally opposing projections of the housing.

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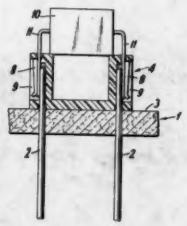
### 3,673,543
### MICRO-CIRCUIT PACK RECEPTACLE

**Peter Garner, Fanwood, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.**

**Filed April 27, 1970, Ser. No. 31,958**
**Int. Cl. H01r *13/50***
**U.S. Cl. 339—61 M** **5 Claims**

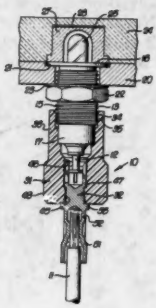


The receptacle of the invention comprises a body having a plurality of apertures adapted to accommodate the leads of a micro-circuit pack and the corresponding pins secured to a wire wrap panel, and disposed in each aperture is a spring means for maintaining a frictional and electrical contact between each leg of the micro-circuit pack and the respective upstanding pin secured to the wire wrap panel.

## 3,673,544
## CONNECTOR FOR LAMP SOCKET

James N. Dupree, South El Monte, Calif., assignor to Dupree, Inc., El Monte, Calif.

Filed Sept. 2, 1970, Ser. No. 69,049
Int. Cl. H01r *33/34*
U.S. Cl. 339—61 L 1 Claim

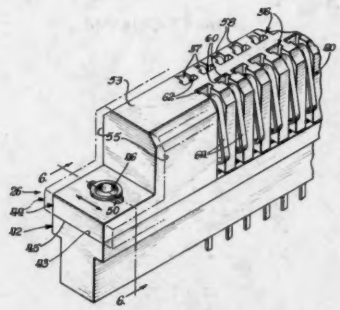


An electrical connector for connecting wire conductors to lamp sockets, such as those used for edge lighted panels. A connector comprising an insulating body and a conductor contact carried within the body, with the contact having a crimp wire receiver on one end and a split barrel terminal receiver on the other. The insulating body is a unitary resilient plastic member which is a push fit onto the socket and which carries the contact into sliding engagement with the conductor pin of the socket.

## 3,673,545
## MINIATURE CONNECTOR CONSTRUCTION—ADJUSTABLE OR FLOATING

David F. Rundle, Camp Hill, Pa., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed Nov. 10, 1969, Ser. No. 875,060
Int. Cl. H01r *21/28*
U.S. Cl. 339—64 M 12 Claims

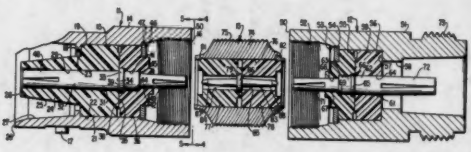


Miniature connector plug of the kind utilized in a package or assembly incorporating a large number of connectors, for use with a socket assembly incorporating the like number of sockets, all of the plugs and all of the sockets being arranged in planes, each plug having portions shiftable transversely for accommodating misalignment between the respective plugs and sockets in a progression of such large numbers of the connectors.

## 3,673,546
## ELECTRICAL CONNECTORS

John L. Green, Magnolia House, High St., and Robert Nelson, 135, Arkwrights, both of Harlow, Essex, England

Continuation-in-part of Ser. No. 706,488, Feb. 19, 1968, abandoned. This application April 20, 1970, Ser. No. 30,126
Int. Cl. H01r *13/54*
U.S. Cl. 339—89 C 6 Claims

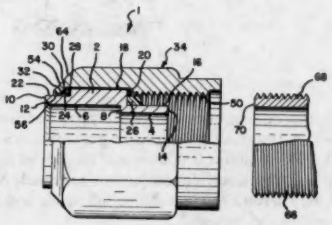


Means for establishing electrical connection selectively between coaxial electrical connectors having similar or different coupling end configurations comprises a plurality of adapters each having first and second coupling ends, the first coupling end of each adapter being such that it can matingly engage the coupling end of a respective one of the said electrical connectors, and the second coupling ends of all the adapters being of the same internally threaded configuration, and a conductive coupler having an external threaded configuration fitting with both adaptors and conductor ends that can matingly engage the conductors of each of the adapters.

## 3,673,547
## CONNECTOR FOR COAXIAL CABLE

George W. Ziegler, Jr., Carlisle, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 22, 1970, Ser. No. 39,840
Int. Cl. H01r *13/54, 17/04*
U.S. Cl. 339—89 C 5 Claims



A connector for a coaxial cable including an outer sleeve adapted to threadably mate with a coupling member and rotatable on an inner sleeve for termination on a coaxial cable, the inner and outer sleeves being separated by washers and a seal which absorbs compression forces and prevent torque transmitted from the coupling member and mated outer sleeve to the coaxial cable.

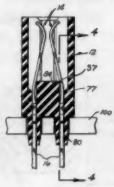
## 3,673,548
## PRINTED CIRCUIT BOARD CONNECTOR

William R. Mattingly, Jr., Santa Ana, and David S. Goodman, Orange, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 19, 1970, Ser. No. 81,826
Int. Cl. H05k *1/07*; H01r *13/64*
U.S. Cl. 339—186 M 4 Claims

A printed circuit board connector having a plurality of contacts mounted in the connector housing. The contacts are formed of a spring contact portion having a contacting surface and a terminal portion interconnected by a central mounting

portion. The contact is inserted in the housing in an unstressed condition and abuts a housing inner wall member upon partial insertion, the contact being positioned adjacent the inner wall member upon full insertion into the housing with a portion of the contact abutting the inner wall member. The contact surface of the contact is normally adjacent the top end of the



housing, remote from the contact portion adjacent the inner wall member. Moreover, the inner wall member may define an edge against which the printed circuit board engages to limit its movement upon insertion of the board into the housing. The contact mounting portion may be provided with means for engaging the housing so as to correctly position the contact in the housing.

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**3,673,549**

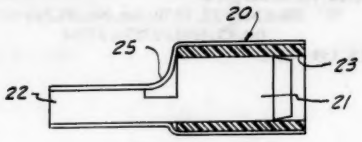
**FULLY INSULATED QUICK DISCONNECT**

**Ward L. Bilby, Chesterland, Ohio, assignor to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed June 1, 1970, Ser. No. 41,998**

**Int. Cl. H01r *9/08***

**U.S. Cl. 339—220 R** **10 Claims**




Quick disconnect connectors are provided which are fully insulated. A thin wall tubing having a wall thickness of from about 0.0005 to about 0.005 inch is employed to provide full insulation of the electrical connector terminal. No secondary operations are required to achieve full insulation and standard crimping dies can be used.

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**3,673,550**

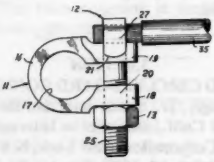
**CABLE TERMINAL**

**Joseph Sherman, Rte. 2, Box 907C3, Fort Worth, Tex.**

**Filed Dec. 11, 1970, Ser. No. 97,256**

**Int. Cl. H01r *11/26***

**U.S. Cl. 339—225** **3 Claims**



A replacement terminal for connecting a battery cable to a battery terminal post includes an integral split ring having parallel outward projecting lugs with a gap between. The clamp defines a tapered bore for enclosing the battery post. A hook bolt extending through aligned bores in the lugs provides an eye at one end for clamping an exposed cable end to one lug. A nut threaded on the opposite end of the hook bolt provides the clamping force for clamping the cable to the ring and for clamping the ring to the battery post.

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**3,673,551**

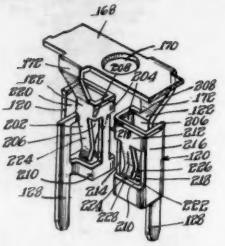
**INTEGRATED CIRCUIT TERMINAL AND METHOD**

**Cletus G. McDonough, Elmhurst, Ill., assignor to Molex Products Company, Downers Grove, Ill.**

**Filed Nov. 28, 1969, Ser. No. 880,574**

**Int. Cl. H01r *5/04, 11/22*; H05k *1/12***

**U.S. Cl. 339—258 R** **6 Claims**



A sheet metal terminal is formed of spring metal such as brass with a plurality of terminals attached to one another in chain fashion by a carrier strip of scrap of the metal blank from which the terminals are formed. Each terminal has a mounting lug or tongue. The lugs or tongues of a plurality of interconnected terminals are inserted through aligned apertures in a pair of parallel rows in a printed circuit board, following which the terminals are flow soldered to the printed circuit board, and the scrap interconnection is cut off. A pair of rows of terminals thus is provided into which the terminals of a "crab pack" integrated circuit may be plugged.

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**3,673,552**

**METHOD AND APPARATUS FOR COMPILING MEASURED VALUES OF A VARIABLE PARAMETER**

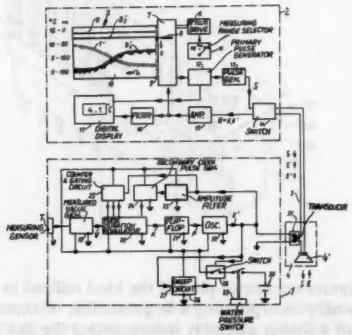
**Siegfried Mross; Hans Grossheim, both of Bremen, Germany, and Michel Aubert, Wimermeux, France, assignors to Fried Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany**

**Filed March 30, 1970, Ser. No. 23,691**

**Claims priority, application Germany, March 28, 1969, P 19 15 956.9**

**Int. Cl. G01s *9/68***

**U.S. Cl. 340—3 R** **19 Claims**



A method and apparatus primarily intended for commercial fishing craft for compiling at an observation station measured values of a variable parameter existing at one or more measur-

ing locations spaced from the observation station by producing a signal which is a function of the instantaneous value of the variable parameter, feeding it to a pulse duration modulator, to produce a modulated pulse whose duration is a function of the instantaneous value of the variable parameter, and controlling the initiation of the modulated pulses by a system which emits a train of spaced wave pulses through one or more acoustical transducers, so that the initiation of the modulated pulses is in a fixed time relation with the wave pulses. A suitable short-interval range recording device is disposed at the observation station, and is connected for receiving the modulated pulses and recording their duration along with the echose of the wave pulses. When a plurality of measured value generators is used, a programmed switch mechanism may be employed to connect the individual generators with their respective wave pulse generators.

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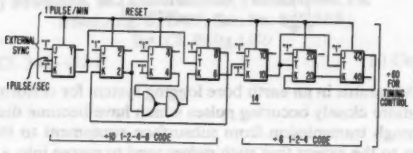
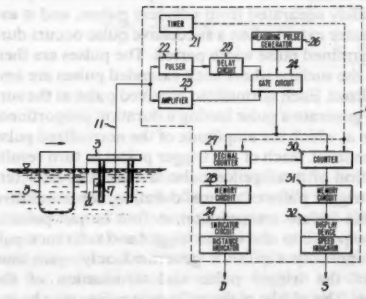
**3,673,553**

## MEASURING INSTRUMENT FOR PILOTING SHIP FOR DOCKING OR LEAVING

**Takahiro Miura, Kawasaki, and Miaki Yamamoto, Tokyo, both of Japan, assignors to Kabushikikaisha Tokyo Keiki Seizosho, Tokyo, Japan**

**Filed June 8, 1970, Ser. No. 44,397**
**Claims priority, application Japan, June 17, 1969, 44/47809**
**Int. Cl. G01s 9/68**
**U.S. Cl. 340—3 R** **4 Claims**




A measuring instrument for piloting a ship for docking or leaving a pier having at least two spaced ultrasonic transducer means provided under water on the side of the pier for transmitting ultrasonic beams substantially perpendicular to the mooring line joining the front surfaces of dolphins, measuring means respectively corresponding to the ultrasonic transducer means, means for measuring the distance between the ship and the pier and the speed of the ship, and means for reporting the measured results to a pilot on the ship.

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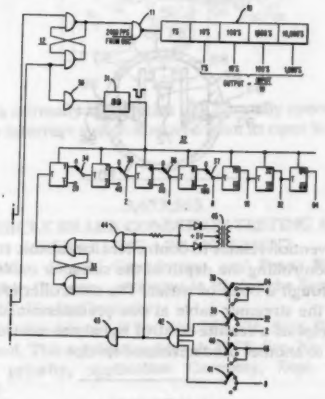
**3,673,554**

## DEPTH SOUNDER DIGITIZER

**Silvan E. McAlpin, Dallas, Tex., assignor to Mobil Oil Corporation**

**Filed Sept. 30, 1969, Ser. No. 862,204**
**Int. Cl. G01s 9/68**
**U.S. Cl. 340—3 R** **4 Claims**

a water depth digitizer produces an averaged digital readout synchronized with an external clock. The digital readout is produced from a depth sounder having a timing cycle which is asynchronous with respect to the clock. A digital counter is started in response to the occurrence of selected acoustic ranging pulses. Pulses which are proportional in time to the velocity of sound in water are counted until the returned echo



from the sea bottom stops the count. Ten counts are accumulated in the digital counter which is arranged to count in decades. The least significant decade is dropped to produce a readout directly representing water depth.

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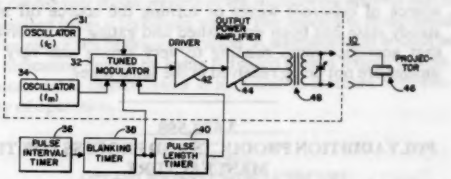
**3,673,555**

## MODULATED CARRIER ACOUSTIC BEACON

**Ilmar G. Raudsep, Seattle, Wash., assignor to Honeywell Inc., Minneapolis, Minn.**

**Division of Ser. No. 741,191, June 28, 1968, Pat. No. 3,559,161, which is a continuation-in-part of Ser. No. 655,662, July 24, 1967, abandoned. This application Oct. 23, 1970, Ser. No. 83,350**
**Int. Cl. H04b 11/00**
**U.S. Cl. 340—5 R** **4 Claims**

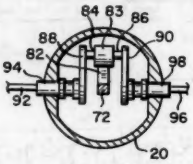



An underwater beacon for transmitting an acoustic signal characterized so as to facilitate accurate determination of the position of an acoustic receiver array relative to the beacon. The beacon comprises a pair of oscillators whose output signals are supplied to a modulator which is further controlled by a timer so as to produce a periodic modulated carrier frequency signal, each period of which is made up of predetermined intervals of unmodulated carrier, modulated carrier, and silence. The output of the modulator is supplied to a driver which energizes an acoustic projector.

## 3,673,556
## TWO-LEVEL DEPTH CONTROLLERS FOR SEISMIC STREAMER CABLES

Paul G. Biggs, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed July 15, 1970, Ser. No. 55,038
Int. Cl. B63b 21/56; G01v 1/16; H01b 7/12
U.S. Cl. 340—7 PG 11 Claims

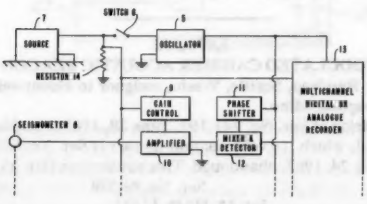



This invention relates to controllers for seismic streamer cables for controlling the depth of the streamer cable while it is towed through a body of water. The controller is adapted to maintain the streamer cable at one predetermined level, and upon receipt of a remote-control signal the controller moves the cable to another predetermined level.

## 3,673,557
## DISCONTINUOUS COHERENT WAVE ACOUSTIC HOLOGRAPHY

Noyes D. Smith, Jr., Bellaire, Tex., assignor to Shell Oil Company, New York, N.Y.

Continuation-in-part of Ser. No. 659,984, Aug. 8, 1967, Pat. No. 3,503,037. This application Feb. 3, 1970, Ser. No. 8,206
Int. Cl. G01v 1/34
U.S. Cl. 340—15.5 H 2 Claims




The response to deep reflecting layers in an acoustic hologram is improved by varying the time at which acoustic wave relating to to various images are radiated either by pulsing the source of coherent waves or turning the source off after a steady state has been established and gating the receivers so that acoustic waves relating to very strong and very weak images are not being received at the same time.

## 3,673,558
## POLYADDITION PRODUCTS AND PROCESS FOR THEIR MANUFACTURE

Rosemarie Toepel, Basel; Heinz Abel, Reinach; Arthur Maeder, Therwil, and Klaus-Dieter Leifels, Binningen, all of Switzerland, assignors to Ciba Limited, Basel, Switzerland

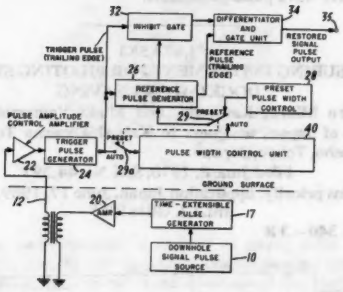
Filed May 4, 1970, Ser. No. 34,596
Int. Cl. C08g 51/24
U.S. Cl. 260—29.2 EP 13 Claims

A stable preparation of reaction products is provided which is prepared by first reacting a liquid polyglycidyl ether of a polyphenol with an aliphatic di-primary diamine and thereafter further reacting the resulting adduct with an epoxy compound. The ratio of epoxide group equivalents to amino group equivalents in the first stage is 1:3 to 5.5 and in the second stage 1:2 to 5. The preparations are useful in the textile industry e.g. for rendering wool non-felting. Especially suitable are the preparations when applied in combination with a dyeing process.

## 3,673,559
## PULSE RESOLUTION SYSTEM

Robert J. Schwartz, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 593,385, Nov. 10, 1966, abandoned. This application Sept. 18, 1968, Ser. No. 767,904
Int. Cl. H03k 4/10; H04b 3/00
U.S. Cl. 340—18 30 Claims




Apparatus in an earth bore logging system for restoring two or more closely occuring pulses which have become distorted through transmission from subsurface equipment to the surface to the extent that such pulses tend to merge into a single pulse of longer duration. Each pulse from the subsurface signal source is extended in duration to a predetermined pulse width when widely separated from adjacent pulses, and is extended to a greater extent when a successive pulse occurs during the predetermined pulse width period. The pulses are then transmitted to the surface where such extended pulses are amplitude normalized. Each normalized received pulse at the surface is used to generate a pulse having a duration proportional to the duration at which the amplitude of the normalized pulse exceeds a given level. Each of the trigger pulses in turn results in the production of a reference pulse terminating after termination of a trigger pulse of normal duration, representative of a single pulse before transmission. A first output pulse is generated in response to one of the trigger and reference pulses and a second output pulse is generated only upon time coincidence of the trigger pulse and termination of the reference pulse. The widths of the reference pulses may be automatically adjusted according to variations in the average widths of the trigger pulses.

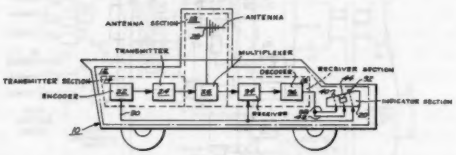
## 3,673,560
## VEHICLE ALERTING SYSTEM

Max K. Barsh, and James N. Edwards, both of Claremont, Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed May 21, 1970, Ser. No. 39,493
Int. Cl. G08g 1/09
U.S. Cl. 340—33 10 Claims

Disclosed is a system for alerting persons in vehicles of the presence in their vicinity of vehicles devoted to responding to emergency situations; the former may be passenger automobiles, buses or other means of public transportation, etc. and the latter may be police cars, fire trucks, ambulances or the like. The system comprises a complete radio station installation in each emergency vehicle and a receiver installation in each passenger vehicle, and both installations may utilize much of the radio equipment already found in such vehicles for other purposes. Thus, in the passenger vehicle, the equip-

ment may comprise an adapter operative to override any normal reception of the car radio to provide an audible and/or visible indication, or a separate indicating receiver of minimum complexity, whereas, in the emergency vehicle, the equipment may comprise a separate modem or one multiplexed to equipment ordinarily serving another function. In the preferred form, the emergency vehicle modem includes a coder-transmitter and a receiver-decoder-indicator both multiplexed to the same antenna, and the passenger vehicle receiver is similar to the receiving equipment of the emergency vehicle.

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**3,673,561**

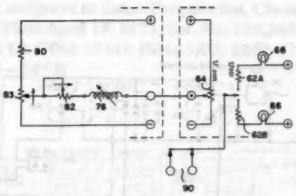
**STEERING INDICATOR**

**Harry Bronstein, 9872 Bridle Road, Philadelphia, Pa.**

**Filed Aug. 6, 1969, Ser. No. 847,863**

**Int. Cl. B60g *1/00***

**U.S. Cl. 340—52 R** **10 Claims**




A steering indicator including gearing to transmit rotation of the steering shaft of an automobile to a worm drive gear. Movement of the worm drive gear changes the position of the pair of insulated brushes which makes contact along resistance areas and this has the effect of changing the resistance in two circuits. One circuit involves an indicating meter, such that a given amount of rotation of the steering shaft causes a change in circuit resistance to cause corresponding deflection of the indicating meter, thereby giving the reading of the front wheels position. The second circuit includes a pair of indicator lights, such that change of resistance in the second circuit causes one of the lights to glow more brightly as the steering wheel is turned further away from its straight ahead position to give additional warning to the driver.

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**3,673,562**

**ANTI-THEFT DEVICES FOR MOTORCYCLES, BICYCLES AND THE LIKE**

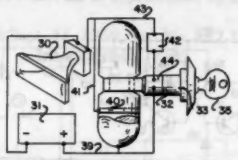
**Eugene F. Buell, Box 418, Grubbs Road R.D. #2, Gibsonia, Pa.**

**Filed April 29, 1970, Ser. No. 32,827**

**Int. Cl. B62h *5/20***

**U.S. Cl. 340—63** **3 Claims**

In an anti-theft device for a motorcycle or the like, a key-operated interrupt switch and a normally open solenoid switch are in series between a power source and a signal means. A tilt switch is provided parallel to the interrupt switch and solenoid switch such that, if the motocycle is tilted while the interrupt switch is closed, the signal means is actuated and the solenoid switch closed to maintain the actuation. The tilt switch is carried from a normally-inoperative to a normally operative position as the interrupt switch is moved from its open to its closed position.

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**3,673,563**

**VEHICLE BRAKE CONDITION TESTING AND SIGNALLING ARRANGEMENT**

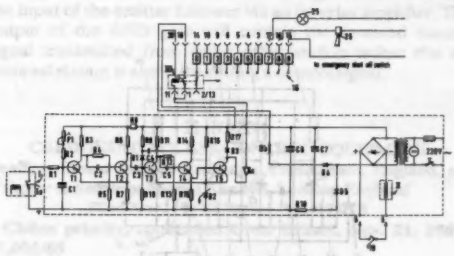
**Heinz Thielen; Harald Grundmann, and Franz Putz, all of Eschweiler, Germany, assignors to Rheinische Braunkohlenwerke AG, Koeln, Germany**

**Continuation-in-part of Ser. No. 759,536, Sept. 9, 1968, abandoned. This application May 4, 1971, Ser. No. 140,060**

**Claims priority, application Germany, Sept. 7, 1967, 16734251**

**Int. Cl. B60q *1/44***

**U.S. Cl. 340—71** **15 Claims**



An arrangement for monitoring and testing of the wear state of mechanical brakes. The movable member which is to be braked operates in conjunction with a signal emitter that emits pulses as a function of the displacement of the movable member. A measuring arrangement is actuated by the pulses from the signal emitter and provides an indication of the braking interval between two predetermined limits of which the first determines the beginning of the monitoring interval and is dependent upon a threshold value. The second is determined by the end of the braking operation. A stepping relay is used as the indicating device by being actuated from a trigger circuit. A monostable multivibrator is included to increase the reliability of operation.

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**3,673,564**

**ASTABLE SWITCHING CIRCUIT**

**Heinz Kammerer, Nellingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany**

**Filed Oct. 8, 1969, Ser. No. 864,674**

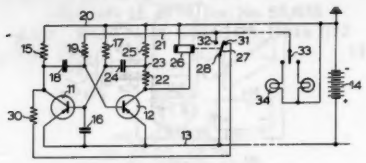
**Claims priority, application Germany, Oct. 18, 1968, P 18 03 843.2**

**Int. Cl. B60q *1/38***

**U.S. Cl. 340—81 R** **9 Claims**

An astable circuit arrangement for providing periodically spaced pulses to a flashing directional light system in motor vehicles. Two transistors of identical conductivity type are intercoupled through capacitive and resistance networks so as

to generate the required pulses for actuating the flashing light. The coil of a relay is also actuated by these pulses, and a single-pole, double-throw switching contact arrangement of the relay connects a resistor in parallel with the emitter-collector



path of one of the transistors, which conducts when the relay coil is de-energized. In the other state of the switching contact arrangement, one terminal of the motor vehicle battery is directly applied to the flashing lamps.

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**3,673,565**

**DIRECTION INDICATOR FOR AUTOMOBILE**

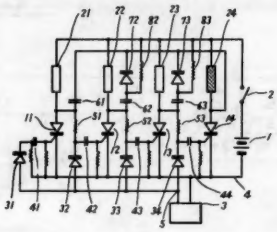
**Seiichi Okuhara, 5, Yoyogi 3-chome, Shibuya-ku, Tokyo, Japan**

**Filed Nov. 14, 1969, Ser. No. 876,853**

**Claims priority, application Japan, Feb. 5, 1969, 44/8128; March 6, 1969, 44/16469; March 18, 1969, 44/20071; July 26, 1969, 44/58769**

**Int. Cl. B60q *1/38***

**U.S. Cl. 340—82** **11 Claims**



An automotive direction and stoplight signalling system using semi-conductor circuits to control the operation of the lights, the circuit operating a first set of two or more lights sequentially to indicate a turn to the right and a second set of lights to indicate a turn to the left. The circuit also includes means to operate all lights simultaneously to indicate that the vehicle is slowing down or stopping.

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**3,673,566**

**USE OF A PLURALITY OF SCANNING DIRECTIONS FOR CHARACTER CENTER LINE DETERMINATION**

**Thomas Pieter Reede, Rijswijk, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

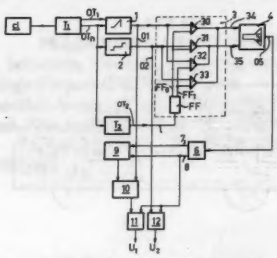
**Filed May 5, 1970, Ser. No. 34,651**

**Claims priority, application Netherlands, May 10, 1969, 6907226**

**Int. Cl. G06k *9/04***

**U.S. Cl. 340—146.3 AE** **7 Claims**

Device for determining the character center line i.e. the line interconnecting the centers of the line elements of a character, comprising a part for displaying a character characterized in that a scanner is provided for scanning the character throughout the character surface in at least two orthogonal directions, a detecting device is provided for determining per scan an intersection of a character line element, while by further detecting circuitry the centers of said intersections can be determined, the set of the centers thus obtained forming



the character center line (FIG. 5). The device may furthermore comprise a checking device for suppressing dark signals of too long a duration and/or light and dark signals of too short a duration.

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**3,673,567**

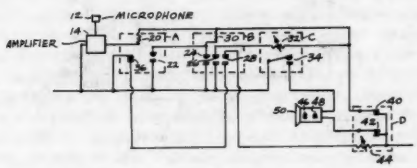
**REMOTE DOG-BARK SUPPRESSOR**

**John F. McClellan, Sr., Stansbury Mill Road, Monkton, Md.**

**Filed Oct. 28, 1970, Ser. No. 84,552**

**Int. Cl. G11b *5/00***

**U.S. Cl. 340—148** **14 Claims**




An acoustic system for remotely suppressing dog barks by replaying the barks of a dog to the dog, creating a mimicking effect by volume change, time delay, modulation change, or pitch change, in one or more combinations appropriate to the dog; pitch change includes rebroadcasting the barks to the dog at pitch frequencies above the characteristic range of human hearing; an arbitrary-sound embodiment is disclosed.

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**3,673,568**

**TIME DIVISION DATA TRANSMISSION SYSTEM HAVING INTERROGATION SIGNAL PASSED THROUGH MATRIX SWITCHES TO JUNCTORS VIA ALL FREE PATHS**

**John Brian Terry, Maldon, England, assignor to The Marconi Company Limited, London, England**

**Filed April 8, 1970, Ser. No. 26,732**

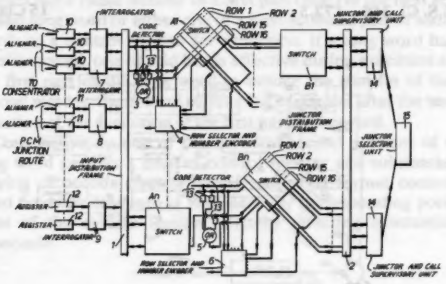
**Claims priority, application Great Britain, April 14, 1969, 19,090/69**

**Int. Cl. H04q *9/00*; H04j *3/00*; H04m *3/00***

**U.S. Cl. 340—147 R** **17 Claims**

A time division multiplex data transmission arrangement has means for applying path interrogation signals to the free row inputs of the device interconnection switches, a switch units wherein each switch has an interrogation signal row and

means for detecting the occurrence of an interrogation signal on any row input this signal being passed to all column outputs of the switch which are free whereby the interrogation signals



pass to the next switches connected to the switch unit output columns such that the signals pass progressively through the switches of the switch unit until they appear via all free paths at the junctors.

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**3,673,569**

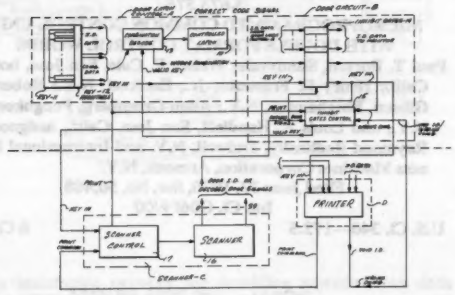
## MULTIPLEXER FOR CONTROLLING AND MONITORING CODED KEY OPERATED ACCESSES

**Robert A. Hedin, and Everett E. Dukes, Jr., both of Yorba Linda, Calif., assignors to Eaton Corporation, Cleveland, Ohio**

**Filed April 19, 1971, Ser. No. 135,265**

**Int. Cl. G06k** *17/00;* **H04q** *3/02;* **E05b** *47/00*

**U.S. Cl. 340—147 R** **12 Claims**



A multiplexer for scannings a plurality of controlled accesses, or doors, for determining if access or entry has been attempted. The scanner is coupled to a multiplicity of such accesses for determining if a key has been placed in its receptacle for operating a controlled latch. The key is preferably an electrical key having unlocking and identification information recorded thereon. If a key-in condition is determined, the scanner is momentarily stopped to allow the information derived from the key to be processed for determining the validity of the unlocking information and the key user identification information. This I.D. control information is also recorded for providing a record of the key usage relative to the time of day, the door and the recorded control information. If the control information is completely valid as to the unlocking information and the identification information only, then is the controlled latch operated.

**3,673,570**

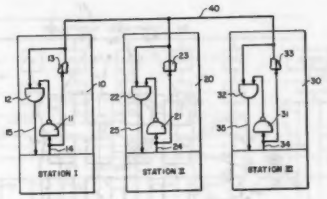
## COMBINATION EMITTER FOLLOWER DIGITAL LINE DRIVER/SENSOR

**Harland J. Cashman, Jr., Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army**

**Filed Sept. 11, 1969, Ser. No. 857,103**

**Int. Cl. H04q** *11/00*

**U.S. Cl. 340—147** **2 Claims**



A combined digital line driver and sensor for both transmitting and receiving digital control signals between a plurality of stations over a single conductor. Each station includes an emitter follower which acts as a fraction of an OR gate for driving the digital control signal over the transmission line. The transmission line is connected to one input of a two-diode AND gate. The other input to the AND gate is connected to the input of the emitter follower via an inverter amplifier. The output of the AND gate will contain the received control signal transmitted from some other station unless the associated station is also transmitting a control signal.

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**3,673,571**

## CREDIT-AND ACCESS-CONTROL EQUIPMENT

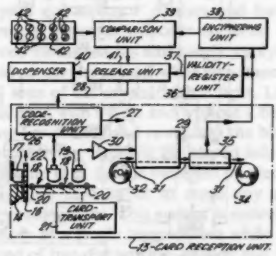
**Geoffrey Ernest Patrick Constable, Cheltenham, England, assignor to Smith Industries Limited, London, England**

**Filed Nov. 19, 1970, Ser. No. 91,018**

**Claims priority, application Great Britain, Nov. 21, 1969, 57,005/69**

**Int. Cl. G06k** *5/00*

**U.S. Cl. 340—149 A** **13 Claims**



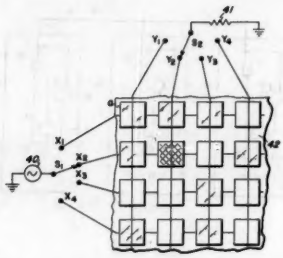
A money-dispensing system is operative to dispense money in response to a bank-customer's magnetically-encoded credit card and keyed-entry of his personal-identification number only if this number accords with the customer's account number as read from an accounting record provided from the card. The record is printed out by a printing drum that is rotated in accordance with signals representing the account number read out from the card by a magnetic reading-head.

3,673,572

## ELECTROLUMINESCENT DEVICE

Philip O. Silva, Fairport, and Gary A. Dir, Penfield, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed Nov. 24, 1969, Ser. No. 879,060
Int. Cl. G08b 5/22; H05b 37/00; H01l 29/18
U.S. Cl. 340—166 EL 15 Claims



An electroluminescent device wherein a memory switch, which requires no holding current or voltage for its maintenance, controls the operation of the electroluminescent layer. When the device is arrayed in a coordinate pattern, individual area of the device can be selectively addressed to form a pattern of visual data.

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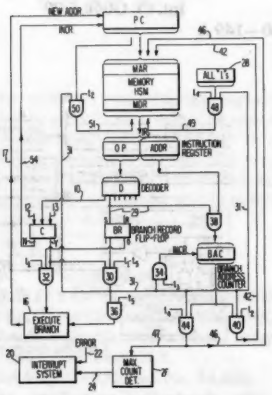
3,673,573

## COMPUTER WITH PROGRAM TRACING FACILITY

Richard Deming Smith, Northborough, Mass., assignor to RCA Corporation

Filed Sept. 11, 1970, Ser. No. 71,455
Int. Cl. G06f 9/18
U.S. Cl. 340—172.5 4 Claims



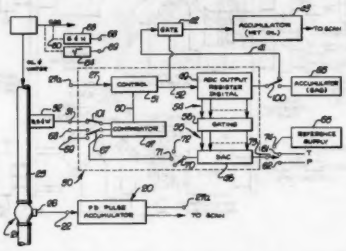

A computer system is disclosed which includes means operative during the execution of a program to record the addresses of all of the branch instructions which result in the taking of the branch path specified by the instruction. The record of addresses is useful in program debugging procedures for determining the place in a program at which an error occurred.

3,673,574

## NET FLUID COMPUTING UNIT FOR USE WITH CENTRAL COMPUTER

Wayne E. Holm, Costa Mesa, Calif., assignor to Hydril Company, Los Angeles, Calif.

Filed Feb. 2, 1970, Ser. No. 7,940
Int. Cl. G01f 5/00
U.S. Cl. 340—172.5 15 Claims




A computing unit usable in a system for computing the quantity of fluid A in a mixture of fluids A plus B flowing during selected intervals of time includes: an accumulator for pulses produced by suitable metering means, each pulse representing the flow of a predetermined quantity of a mixture of fluids A plus B (as for example oil and water); the accumulator having an output which represents the total quantity of fluid A plus B flowing during at least one of the intervals; a converter responsive to such pulses repeatedly to digitize an input signal which represents the proportion of fluid A in the mixture, and as a function of pulse reception, there being an output register connected to receive the digitized signal; and an accumulator for the contents of the register to accumulate a digital quantity which represents the net amount of fluid A in the mixture that has flowed from the beginning of that one interval.

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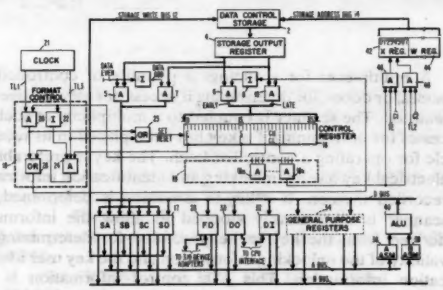
3,673,575

## MICROPROGRAMMED COMMON CONTROL UNIT WITH DOUBLE FORMAT CONTROL WORDS

Paul T. Burton, Sunnyvale; Walter E. Cole, San Jose, both of Calif.; Henry E. Frassetto, Jr., Endicott, N.Y.; Robert G. Gibson, Binghamton, N.Y.; Allan Greenberg, Poughkeepsie, N.Y., and Louis E. Handloff, San Jose, Calif., assignors to Raymond Radlinsky, Endwell, N.Y. and International Business Machines Corporation, Armonk, N.Y.

Filed June 29, 1970, Ser. No. 50,408
Int. Cl. G06f 9/00
U.S. Cl. 340—172.5 6 Claims




A microprogrammed common control unit for effecting the transfer of data between I/O (input/output) devices and the main storage unit of a data processing system, uses both long

format control words and short format control words, the short words having half as many bit positions as the long words in the preferred embodiment, thereby minimizing the size of control storage required.

Addressing of the control storage unit effects readout of one long word or a pair of short words. Predetermined bits in each control word cause transfer of a first part (half) of the next accessed long word or either one of a next accessed pair of short words to a control register for execution. If a long word has been accessed, one of said bits is effective during execution of the first part of the long word to initiate the transfer of the second word to the control register for execution after the termination of the execution of the first part of the word.

Consecutive decode of the first and second portions of a long word permits a smaller control register and substantial sharing of decode circuits by different long format control word fields entered into at least partially corresponding positions of the control register, thereby effecting substantial economies.

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**3,673,576**

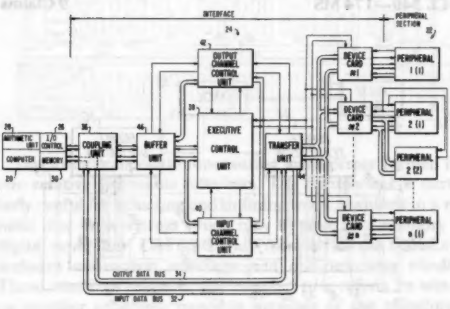
## PROGRAMMABLE COMPUTER-PERIPHERAL INTERFACE

**John C. Donaldson, Jr., Peabody, Mass., assignor to E.G. & G., Inc., Bedford, Mass.**

**Continuation-in-part of Ser. No. 886,689, Dec. 16, 1969, abandoned. This application July 13, 1970, Ser. No. 54,556**

**Int. Cl. G06f *3/00***

**U.S. Cl. 340—172.5** **39 Claims**




An interfacing network for providing asynchronous data transfers directly with a computer memory and external devices. Computer instructions from the computer arithmetic unit are decoded in an executive control unit. Certain instructions ready an input or output channel control unit which thereafter controls data transfers with a selected external device. Each transfer is made directly with the computer memory and does not require interruption of the program being processed in the arithmetic unit. Once the input or output channel control unit assumes control of the transfer, the executive control unit is immediately available to perform other functions independently and concurrently. It may ready the other channel control unit and monitor external device and interface conditions including the readiness of an external device to transmit data. Certain monitored conditions cause the interfacing network to interrupt normal computer operation. Various control signals in the executive control unit are translated to and from control signals in the computer and external devices to permit the utilization of common instructions.

**3,673,577**

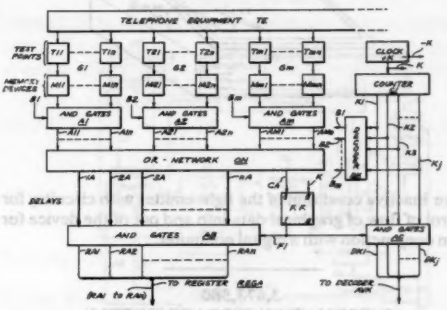
## PROCESS CONTROL SCANNER APPARATUS

**Nils Herbert Edstrom, Vallingby, and Goran Anders Henrik Hemdal, Tryeso, both of Sweden, assignors to Telefanaktiebolaget LM Ericsson, Stockholm, Sweden**

**Continuation-in-part of Ser. No. 859,315, Sept. 19, 1969. This application Jan. 25, 1971, Ser. No. 109,478**

**Int. Cl. G05b *23/02*; G06f *11/06***

**U.S. Cl. 340—172.5** **2 Claims**




A process control computer scans test points arranged in groups to perform operations in accordance with changes in the states of the test points. The data store of the computer stores the states of the test points as words wherein each work represents a group of test points and the bits of the words represent the test points of the group. A flag resister of the data store comprises a group of bit cells with each bit cell being associated with one of the words. During the scan if the change of state of a test point changes, the associated bit in the data store is changed and the flange bit of the associated word is marked. Thereafter, the computer need only scan those words whose flag bits have been marked.

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**3,673,578**

## METHOD OF INFORMATION STORAGE USING ELECTRO-OPTIC PROPERTIES OF COLOR CENTERS IN ALKALI HALIDE CRYSTALS

**Irwin Schneider, 2402 Daphne Lane, Alexandria, Va.**

**Filed Nov. 18, 1970, Ser. No. 90,800**

**Int. Cl. G11c *11/42*, *13/04***

**U.S. Cl. 340—173 CC** **3 Claims**

A method of storing, reading and erasing information in an alkali halide crystal containing F centers and having semi-transparent electrical layers on opposite surfaces. Binary information is stored or erased by alternately applying a high D.C. electric field across the crystal while simultaneously illuminating a small area of the crystal with F light. Light exposure of the crystal area with a field and without a field may be equated to writing (or erasing and rewriting) the binary digits zero and one, respectively. Reading the stored information is similar except that the D.C. field is switched on electronically after sensing the digit zero so as to erase any absorption produced by the reading light. This system is entirely fatigue-free and is operable at a single temperature while using one laser beam, instead of two, for writing, erasing and reading in an effectively nondestructive manner.

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**3,673,579**

## DRAWINGBOARD II, A GRAPHICAL INPUT-OUTPUT DEVICE FOR A COMPUTER

**Robert Michael Graven, 203 Holly Lane, Orinda, Calif.**

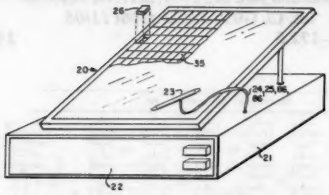
**Filed Aug. 26, 1970, Ser. No. 70,626**

**Int. Cl. G11c *13/04***

**U.S. Cl. 340—173 LS** **33 Claims**

A two-dimensional matrix of semi-conductors is arranged in ordered array as a flat, light emitting and light sensing device

activated both electrically and by radiant energy from a penlight to achieve a graphical input and output display by the active or inactive condition of the light emitter with circuitry for control of flow of graphical data into and out of the device for use in conjunction with a digital computer.

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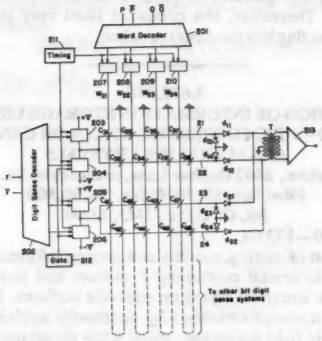
**3,673,580**

**INFORMATION STORAGE SYSTEM**

**Kohichi Hasegawa, and Norihiko Kunishima, both of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan**

**Filed Oct. 16, 1970, Ser. No. 81,493**
**Claims priority, application Japan, Oct. 25, 1969, 44/85361**
**Int. Cl. G11c 5/02, 11/06**
**U.S. Cl. 340—174 PC** **6 Claims**




A two-line information storage system including read-out and write-in driver circuits, a word selection circuit for producing address output signals, a digit sense decoder for producing output signals to select one of the read-out or write-in circuits at a given time, an output amplifier, a plurality of pairs of signaling transmission lines interconnecting the read-out and write-in driver circuits and containing a plurality of memory elements for producing sensed output signals in response to the word selection circuit output signals and direct current flowing in a selected one line pair, and a plurality of unidirectional diodes connecting the output ends of the respective line pairs to the amplifier input for transmitting the sensed signals thereto from one line pair while blocking the transmission of the direct current and the sensed signals from the one line pair to the other line pair.

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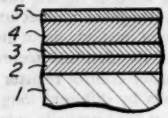
**3,673,581**

**PLATED MAGNETIC WIRE**

**Hideki Nishida; Kunihiko Yamaguchi; Noriyuki Kumasaka, all of Hachioji-shi; Yutaka Sugita, Kodaira-shi, and Hideo Fujiwara, Tachikawa-shi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Feb. 18, 1971, Ser. No. 116,452**
**Claims priority, application Japan, Feb. 27, 1970, 45/16274**
**Int. Cl. G11c 11/14**
**U.S. Cl. 340—174 PW** **1 Claim**




A four-layered plated wire comprising a non-magnetic metal substrate, and non-magnetostrictive 81 % Ni-19 % Fe permalloy films and Co-Ni films alternately superposed on said non-magnetic metal substrate, wherein the permalloy film placed between the two Co-Ni films has a thickness of 0.3 – 0.6 $\mu$ and the other permalloy film has a thickness of 0.2 – 0.4 $\mu$.

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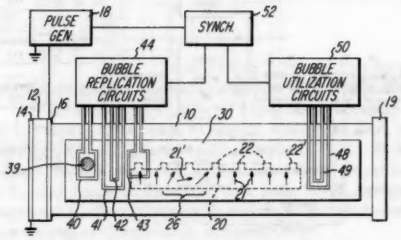
**3,673,582**

**BUBBLE DOMAIN SONIC PROPAGATION DEVICE**

**Richmond Bennett Clover, Jr., Cranbury, N.J., assignor to RCA Corporation**

**Filed May 17, 1971, Ser. No. 143,864**
**Int. Cl. G11c 19/00, 11/14**
**U.S. Cl. 340—174 MS** **9 Claims**




A single wall magnetic domain or bubble is advanced in a sheet of magnetic material such as an orthoferrite by means of a sonic stress wave propagated through a contiguous channel-defining member of anisotropic, magnetostrictive material such as permalloy. A sonic stress wave propagated through the permalloy member causes a propagated region in which the direction of magnetization in the permalloy is partially rotated. The propagated region of rotated magnetization urges the magnetic bubble in the same direction along a path in the orthoferrite.

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**3,673,583**

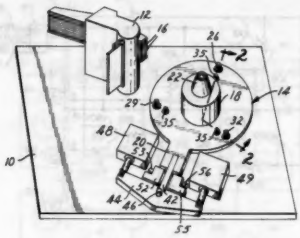
**RECORDER WITH MEANS TO MOVE THE SPINDLE PERPENDICULAR TO ITS AXIS OF ROTATION**

**Wayne M. Wirth, North Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Aug. 11, 1970, Ser. No. 62,891**
**Int. Cl. G11b 17/02, 21/00**
**U.S. Cl. 340—174.1 C** **8 Claims**

A disk recorder wherein the disk is supported on a driven spindle and a transducer spaced from the disk surface is moved stepwise generally radially of the disk to record and

reproduce information in spaced concentric circular tracks on the disk. The spindle is moved perpendicularly to its axis to either side of a central position whereat the transducer would



be stepwise aligned with predetermined concentric circular tracks on the supported disk to adjust the position of the tracks with respect to the transducer.

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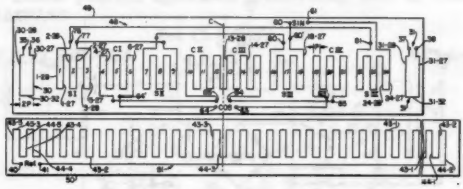
**3,673,584**

## POSITION-MEASURING TRANSFORMER HAVING END-DETECTING WINDINGS USEFUL FOR POSITIONING A MAGNETIC HEAD OF A DISC DRIVE SYSTEM

**Clair L. Farrand, Bronxville, N.Y., assignor to Inductosyn Corporation, Valhalla, N.Y.**

**Filed March 8, 1971, Ser. No. 121,951**
**Int. Cl. G01r *33/02*; H01f *21/04*; G11b *27/14***
**U.S. Cl. 340—174.1 C** **12 Claims**



Disclosed is a position-measuring transformer formed from two relatively movable members. The transformer is particularly useful for selecting and defining track positions in a magnetic disc drive system which may be used as a memory in a digital computer. One stationary member of the transformer includes cofunction windings and end-detecting windings. Those windings magnetically coupled to a reference winding on another relatively movable member of the transformer. The reference winding, which is the continuous winding of the transformer, is formed from a plurality of equally spaced active conductors. The active conductors are interconnected such that alternate ones conduct in opposite directions so that each pair of adjacent active conductors define a reference cycle. The end-detecting windings consist of one or more pairs of active conductors where the active conductors in each pair have full-cycle spacing, that is, the separation between each active conductor in a pair equals one reference cycle. The full-cycle spacing of the end-detecting winding superposed over the half-cycle spacing of the end-detecting winding induces a substantially zero resultant signal in the end-detecting winding except when the end-detecting winding is positioned over the end conductor of the reference winding as may occur when the reference winding is moved. When over the end, a limit signal is generated as a result of the unequal coupling between the end-detecting winding active conductors and the end conductor of the reference winding. The limit signal thus generated typically defines the inner or outer limit of a read/write head. Cofunction windings are formed from four winding sections with equal numbers of active conductors per section. The cofunction windings are formed using an efficient winding pattern which minimizes the number of welded or soldered connections required.

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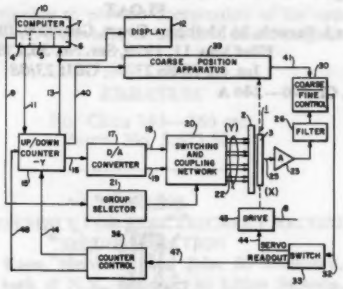
**3,673,585**

## POSITION MEASURING TRANSFORMER HAVING MULTIPLE INDEPENDENT SECTIONS FOR REDUCTION OF MEASUREMENT ERRORS

**Robert W. Tripp, Tuckahoe, and Robert Z. Geller, Wantagh, both of N.Y., assignors to Inductosyn Corporation, New York, N.Y.**

**Filed Oct. 5, 1970, Ser. No. 77,765**
**Int. Cl. G08c *19/00***
**U.S. Cl. 340—198** **17 Claims**




A method and apparatus for measuring linear and rotary positions with position measuring data elements, such as position measuring transformers, where the data elements are affected by error-causing conditions such as eccentricity and skew. Measurements are made so as to avoid the compound effects of eccentricity and skew by dividing the conventional, continuous space-quadrature windings appearing on one member of the transformer, into a plurality of windings groups where the continuous winding of the other member remains unchanged. Each group typically includes a plurality of interconnected sine and a plurality of inter-connected cosine winding sections where those winding sections are in space-quadrature of the pole cycle of the continuous winding. The measurements made from each group, in one embodiment, are averaged to form a highly error-free resultant measurement. In another embodiment, the difference between group measurements are employed to form a measurement of the eccentricity of one member with respect to the other.

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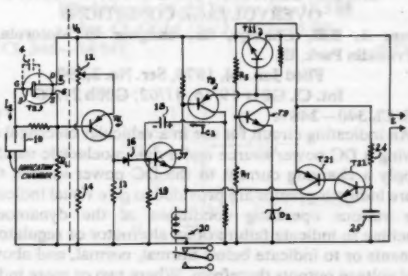
**3,673,586**

## RESISTANCE CONTROLLED TIMED PULSE GENERATOR

**Lyman L. Blackwell, Denver County, Colo., assignor to Statitrol Corporation, Lakewood, Colo.**

**Filed Feb. 19, 1970, Ser. No. 12,720**
**Int. Cl. G08b *17/10***
**U.S. Cl. 340—237 S** **10 Claims**



An electronic switching circuit responsive to a change of resistance in a sensing element, which circuit includes an insu-

lated gate field effect transistor, a source of power, switching means interconnecting the source of power and the said transistor and a resistive sensing element interconnecting the gate of the said transistor and the power source, whereby the resistance of the sensing element controls the time required to charge the gate capacitance of the transistor and whereby the switching means opens the circuit delivering power to the transistor at such time as the gate capacitance is substantially charged.

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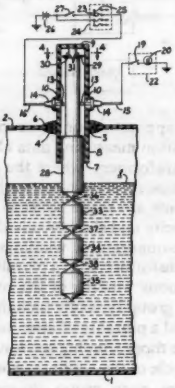
**3,673,587**

## LIQUID LEVEL INDICATOR HAVING AN ADJUSTABLE FLOAT

**John J. Baruch, 36 Mulberry Court, Glenview, Ill.**

**Filed May 11, 1970, Ser. No. 36,138**
**Int. Cl. G08b *23/00*; G01f *23/08***
**U.S. Cl. 340—244 A** **2 Claims**



A device for indicating a low level in the reservoir of an automobile windshield washer system comprises a warning light on the vehicle's dashboard and a float-controlled switch that operates the warning light when the float drops to a predetermined level. At its lower end, the float has a series of end-to-end elements that are joined together by flangible connections so that one or more of the sections can be removed to shorten the float and allow it to be used in reservoirs of different depths.

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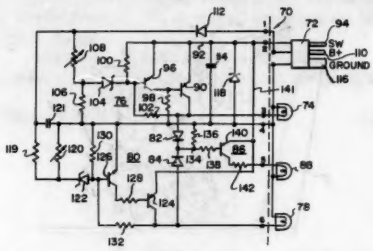
**3,673,588**

## VOLTAGE REGULATOR INDICATING CIRCUIT FOR UNDERVOLTAGE, NORMAL VOLTAGE AND OVERVOLTAGE CONDITIONS

**James A. Riff, Chicago, Ill., assignor to Motorola, Inc., Franklin Park, Ill.**

**Filed Jan. 14, 1970, Ser. No. 2,890**
**Int. Cl. G01r *19/16, 31/02*; G08b *21/00***
**U.S. Cl. 340—248 A** **7 Claims**

An indicating circuit for use in a vehicular electrical system having a DC power source and a dynamoelectric machine to supply a charging current to the DC power source. One or more indicating lamps are provided to give visual indication of the various operating conditions of the dynamoelectric machine to indicate failure of an alternator or regulator components or to indicate below normal, normal, and above normal voltage outputs therefrom. Where two or more indicating lamps are used, they are controlled by voltage differential amplifiers having gated outputs therefrom connected to a third amplifier. The third amplifier control energization of the indicating lamp which indicates the normal voltage output of the dynamoelectric machine, and energization of either of the two



voltage differential amplifier circuits will render the third amplifier inoperative by a signal through the associated gate circuit.

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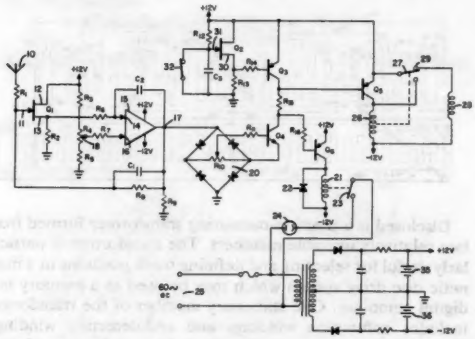
**3,673,589**

## INTRUDER DETECTOR

**Robert W. Barrett, Hennepin, and Pat. S. Preese, Fridley, both of Minn., assignors to Current Industries, Incorporated, Minneapolis, Minn.**

**Filed May 5, 1969, Ser. No. 821,868**
**Int. Cl. G01r *29/12***
**U.S. Cl. 340—258 D** **10 Claims**



A probe is located to carry electric currents brought about by change in the surrounding electrostatic field to produce a signal feeding a high input impedance circuit connected to an operational amplifier connected in the feedback mode to produce an output signal indicative of the presence of an object in the vicinity of the probe which disturbs the electrostatic field. The latter signal is used to feed a monitoring circuit which indicates that the device is operational and an alarm circuit which may be selectively activated.

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**3,673,590**

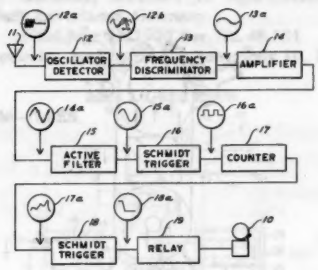
## DEVICE TO DETECT MOTION

**Joseph A. Corvi, Newport Beach, and William G. Lawrence, Costa Mesa, both of Calif., assignors to Corvonics Corporation, Costa Mesa, Calif.**

**Filed Oct. 8, 1969, Ser. No. 864,586**
**Int. Cl. G08b *13/00***
**U.S. Cl. 340—258 A** **10 Claims**

A motion detector in which an oscillator-detector transmits a series of narrow bursts of radio frequency, electromagnetic energy, the period of which varies as a function of the radial motion of the object relative to the detector, and the varying pulse frequency provides information that an object is moving radially.

Such a detector in which the varying pulse frequency of the oscillator-detector is converted to a varying D.C. voltage the




magnitude of which varies at a rate determined by the rate of movement of the object, the varying voltage effecting energization of an alarm.

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**3,673,591**

**YARN DEFECT DETECTOR APPARATUS FOR TEXTILE MACHINERY**

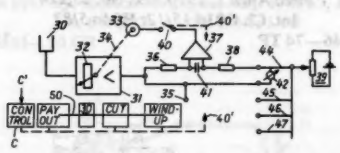
**Hermann Schwartz, Adliswil, Switzerland, assignor to Siegfried Peyer, Bach, Switzerland**

**Filed Oct. 27, 1970, Ser. No. 84,401**

**Claims priority, application Switzerland, Nov. 6, 1969, 16507/69**

**Int. Cl. G08b** *21/00*

**U.S. Cl. 340—259** **9 Claims**




To detect small variations from a standard thread size and to prevent spurious operation of the yarn gauge, particularly upon re-starting of yarn winding machines after shut down, an electrical reference source is provided supplying a reference potential, which is compared with a normal signal level corresponding to yarn passing through a measuring head. An error signal, obtained upon slow deviation of the normal signal with respect to the reference, controls the amplification of an amplifier connected to the measuring head to null the error signal. Short-time signal swings indicative of defects are not compared with the reference so that defect signals are sensed normally.

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**3,673,592**

**LOCKOUT FOR PORTABLE APPLIANCE WITH CASTER JACK MECHANISM**

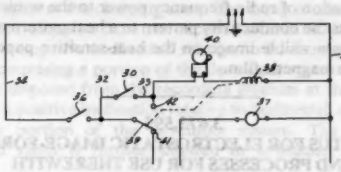
**William R. Berry; Reinhold A. Drews, both of Stevensville, and Julius J. Grau, Berrien Springs, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.**

**Filed Aug. 21, 1970, Ser. No. 65,885**

**Int. Cl. G08c** *21/00*

**U.S. Cl. 340—283** **5 Claims**

Portable appliance of the type in which a cabinet is supported on a frame having retractable caster wheels, the appliance being provided with a switch which is operable by movement of the wheels into a cabinet raising position, the



switch functioning to prevent energization of the appliance when the cabinet is elevated, as well as to afford a signal.

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**ERRATUM**

For Class 343—766 see:
Patent No. 3,673,606

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**3,673,593**

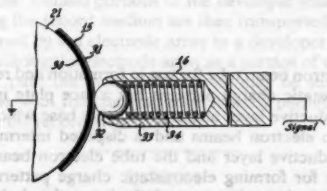
**STYLUS ASSEMBLY FOR ELECTRICALLY RECORDING OF INFORMATION**

**George W. Kaye, Malverne, and John R. Shonnard, East Setauket, both of N.Y., assignors to Litton Systems, Inc., Beverly Hills, Calif.**

**Filed Jan. 13, 1970, Ser. No. 2,541**

**Int. Cl. G01d** *15/06, 15/16*

**U.S. Cl. 346—74 ES** **3 Claims**




Apparatus for electrically recording information on a recording sheet or web having a dielectric charge-retaining surface comprising a ball-tipped stylus in contact with the sheet or web. Signal potentials applied to the stylus produce a charge pattern on the sheet or web which may be developed by a suitable toner. The ball in the tip of the stylus maintains uniform contact with the surface of the recording sheet or web and insures satisfactory recording over an extended period of use.

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**3,673,594**

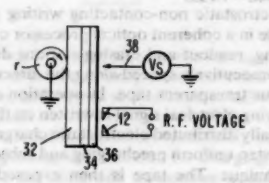
**PHOTOCOPYING DEVICE**

**Benjamin Kazan, Briarcliff Manor, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed March 16, 1970, Ser. No. 19,588**

**Int. Cl. G01d** *15/12*; **G03g** *15/00*

**U.S. Cl. 346—74 MT** **8 Claims**




Photocopying and magnetic recording re enhanced by employing a recording medium, such as a heat-sensitive paper or a magnetic film adjacent to a semiconductor layer. When the

semiconductor is exposed to a low level light image, a charge pattern is created in its surface which is retained and which produces a conductivity pattern in the semiconductor layer. The application of radio-frequency power to the semiconductor converts the conductivity pattern to a heat pattern which is recorded as a visible image on the heat-sensitive paper or as data on the magnetic film.

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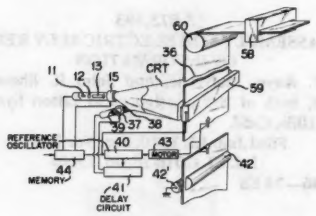
**3,673,595**

**APPARATUS FOR ELECTROSTATIC IMAGE-FORMING AND PROCESSES FOR USE THEREWITH**

**Eiichi Inoue; Keizo Yamaji; Hiroshi Tanaka, and Takashi Saito, all of Tokyo, Japan, assignors to Canon Camera Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 20, 1969, Ser. No. 800,961**
**Claims priority, application Japan, Feb. 27, 1968, 43/12741**
**Int. Cl. G03g** *13/22, 15/22*
**U.S. Cl. 346—74 ES** **27 Claims**




An electron beam tube for use in formation and recordation of electrostatic charge patterns has a face plate including a photoconductive layer and a conductive base which is transmissive to electron beams and is disposed intermediate the photoconductive layer and the tube electron beam emitter. Processes for forming electrostatic charge patterns in such face plate include the steps of placing an insulative charge-retaining layer in contact with the photoconductive layer, the insulative layer either being previously charged or being charged while in position on the photoconductive layer, and applying a voltage to the face plate and simultaneously irradiating the photoconductive layer with pattern-indicating electron beams. Electrostatic charge patterns thus-formed in the insulative layer may be developed in place or transferred and subsequently developed.

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**3,673,596**

**ELECTRO-OPTICAL PROCESSOR HAVING ELECTRICAL SIGNAL WRITING MEANS**

**Donald Howland McMahon, Carlisle, and Allen Raymond Franklin, Concord, both of Mass., assignors to Sperry Rand Corporation**

**Filed Jan. 23, 1970, Ser. No. 5,438**
**Int. Cl. G01d** *15/06;* **H04n** *5/80*
**U.S. Cl. 346—74 ES** **2 Claims**

An electrostatic non-contacting writing apparatus adaptable for use in a coherent optical processor comprising writing, developing, readout and erasing stations disposed proximate to and consecutively spaced along the direction of motion of a continuous transparent tape. In operation of the processor a time-varying electrical signal is written on the tape in the form of a spatially distributed electrostatic charge pattern by means of a two-step uniform precharging and subsequent partial erasure technique. The tape is then exposed to an oppositely charged cloud of toner particles at the developing station whereupon the electrostatic charge pattern is converted to a visible image of varying transparency by virtue of the toner adhering to selective regions of the tape. Optical processing is performed as the visible image passes the readout station whereat it intersects a laser beam and thereafter the toner

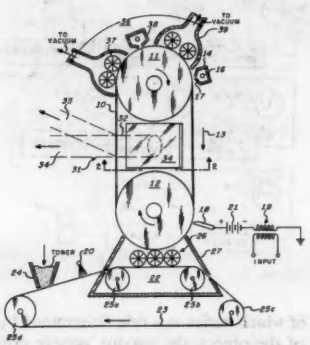


image is erased from the tape in readiness for the next cycle of operation commencing at the writing station.

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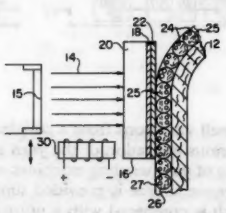
**3,673,597**

**METHOD AND APPARATUS FOR RECORDING AND/OR DISPLAYING IMAGES UTILIZING THERMOMAGNETICALLY SENSITIVE MICROSCOPIC CAPSULES**

**William R. Horst, Dayton, and Lowell Schleicher, Xenia, both of Ohio, assignors to The National Cash Register Company, Dayton, Ohio**

**Filed April 2, 1970, Ser. No. 25,224**
**Int. Cl. G01d** *15/12;* **H04n** *5/82*
**U.S. Cl. 346—74 TP** **15 Claims**

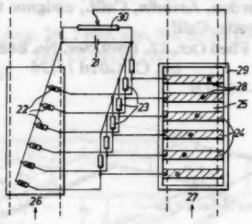



A method of producing a record of original images wherein the images are converted to equivalent heat images, the heat images are then transferred to a heat and magnetic field sensitive medium, and the final image is made readable by the action of magnetic means. A method of providing an information display which is viewable by means of reflected light and adaptable to be sustained in memory or reusable by erasure of the displayed information. The heat and magnetic field sensitive medium incorporates a capsular coating wherein the capsules contain magnetic particles suspended in a heat-meltable material, so that, as the material is changed from a solid to a flowable state by heating thereof, the particles with the scope of the heat image have freedom of motion and are rearranged by the magnetic field to a pattern corresponding to that of the original image, whereby the image is reproduced on the medium upon cooling of the heat-meltable material.

## 3,673,598
## APPARATUS FOR THE ELECTROGRAPHIC RECORDING OF CHARGE IMAGES

Walter Simm, Leverkusen, and Rudolf Muller, Deisenhofen, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 22, 1970, Ser. No. 48,151
Claims priority, application Germany, July 10, 1969, P 19 34 890.4
Int. Cl. G01d *15/06*
U.S. Cl. 346—74 ES 4 Claims

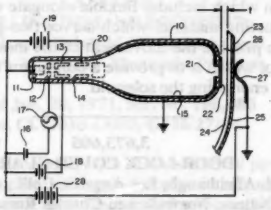


Imagewise differentiated electric charges are produced on a dielectric carrier material an apparatus for performing that production of imagewise differentiated electric charges comprising means for generating a constant corona discharge and means for controlling the amount of the corona discharge in order to obtain an imagewise differentiation.

## 3,673,599
## ELECTROSTATIC PRINTING APPARATUS

Takao Tagawa, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed July 29, 1970, Ser. No. 59,196
Claims priority, application Japan, Aug. 1, 1969, 44/61809
Int. Cl. G03g *15/00;* H04n *1/30*
U.S. Cl. 346—74 CR 6 Claims



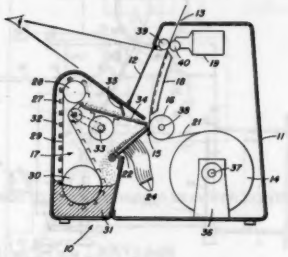
The printing apparatus has a new type of cathode ray tube which utilizes electrostatic charge deposition. The tube contains a single continuous dielectric plate which forms its face plate. Charges are deposited only on a portion of the dielectric plate where the electron beam strikes and then transferred through the air gap from the dielectric plate to paper by a means of discharge caused by potential difference across the air gap.

## 3,673,600
## ELECTROGRAPHIC RECORDING METHOD AND APPARATUS

David E. Damouth, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Sept. 30, 1969, Ser. No. 862,369
Int. Cl. G03g *15/08;* H04n *1/30*
U.S. Cl. 346—74 ES 15 Claims

Electrographic recording apparatus in which the latent electrostatic charge patterns recorded on a dielectric recording medium are rendered visible substantially coextensive with the deposition of the charge patterns on the recording medium. The recording medium is transported in a generally vertical direction at the charging zone. The array of charging electrodes are disposed from the record medium at the charging zone at a negative inclination relative to horizontal to form a ramp comprising a portion of the developer system. A second ramp is disposed from the recording medium at the charging zone at a positive inclination relative to horizontal, comprising another portion of the developer system. The positively inclined ramp is further situated in a manner such that

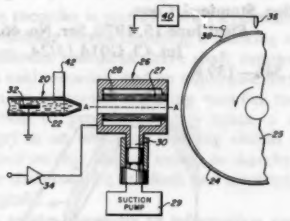


developer material will be transported down the ramp in substantially uniform quantities to contact the recording medium. As the developer material contacts the recording medium, toner from the developer material will be attracted to the latent electrostatic charge patterns to render the charge patterns visible. Unused portions of the developer material after contacting the record medium are then transported down the ramp formed by the electrode array to a developer reservoir. By thus utilizing the electrode array as a portion of the overall developer path the development zone may be substantially coextensive with the charging zone thereby permitting rapid viewing of the recorded information.

## 3,673,601
## LIQUID JET RECORDER

Carl Hellmuth Hertz, Skolbanksvagen 8,, 223 67, Lund, Sweden

Filed March 31, 1970, Ser. No. 24,140
Claims priority, application Sweden, April 2, 1969, 4689/69
Int. Cl. G01d *15/18*
U.S. Cl. 346—75 5 Claims

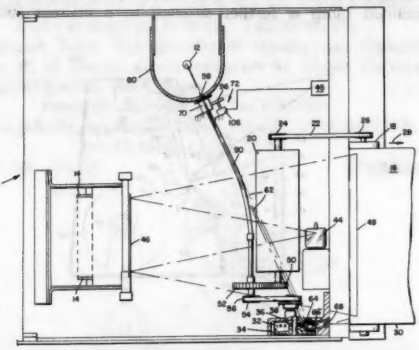



The present device is a liquid jet recorder having a capillary nozzle out of which an electrically conductive ink jet is expelled by pressure, and a control electrode or tube coaxially surrounding the path of the jet, the wall of the tube being porous to the ink and formed of an electrically conductive material. Charging means are included for charging the jet at one potential and the electrode at another potential. The recording surface upon which the ink jet is intended to selectively write is provided with means for selectively charging the surface at a potential which repels any drops of the jet from striking the surface.

## 3,673,602
## OSCILLOGRAPH RECORD IDENTIFICATION APPARATUS

Rafn Stefansson, San Marino, and Robert A. Beanston, Arcadia, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed July 30, 1970, Ser. No. 59,436
Int. Cl. G01d 13/00
U.S. Cl. 346—107 A 6 Claims

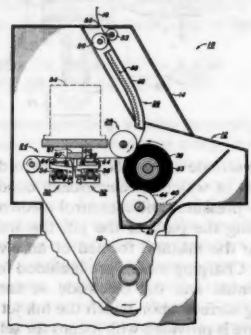


In a recording oscillograph, apparatus for automatically recording on the oscillograph paper, and simultaneously with the recording thereon of one or more galvanometer traces, an indication of a selected control setting of an adjustable operative condition of the oscillograph. In an oscillograph which is provided with apparatus for applying timing lines on the moving paper, a preferred embodiment includes transparent indicia corresponding to various timing line intervals serially arranged in an opaque member, and a shutter member is driven in a light path synchronously with the driven opaque member such that only one of the timing indicia is projected onto the moving paper during a revolution of the opaque member, while preventing the projection of the others of the timing indicia during that cycle. Means responsively connected to the timing line control means automatically adjusts the phase relationship of the rotating shutter with respect to the rotating opaque member, so that the projected one of the timing indicia corresponds to the selected setting of the timing line control means.

## 3,673,603
## RECIPROCATING CARRIAGE FOR ELECTROGRAPHIC PRINTING

John L. Brock, Thruway Homes, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 15, 1970, Ser. No. 46,674
Int. Cl. G01d 15/24
U.S. Cl. 346—139 R 13 Claims

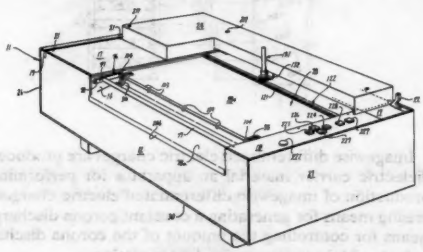


Printing apparatus employing a pair of reciprocating print heads, one of which traverses the entire print field in a record mode while the other one moves in the opposite direction in an inoperative mode. The print heads are supported for movement on separate, spaced apart guide rails such that the pens thereof print along the same line relative to a moving recording web. To this end, structure is provided for causing movement of the non-printing pen out of the path of travel of the other pen as well as disengagement from the recording medium.

## 3,673,604
## GRAPHIC RECORDER WITH PEN DRIVING AND ACTUATING MECHANISM

James F. Gordon, Arcadia, Calif., assignor to Zeta Research, Inc., Lafayette, Calif.

Filed Oct. 22, 1969, Ser. No. 868,340
Int. Cl. G01d 15/26
U.S. Cl. 346—139 B 4 Claims

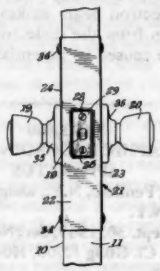


Graphic recorder for use with a strip chart in which a framework is provided having a table over which the strip chart is adapted to travel. Means is mounted on the framework for causing movement of the strip chart on the table along an X-axis. A mounting block is mounted on the framework for movement along a Y-axis. A pen is carried by the mounting block and is movable into and out of engagement with the strip chart. Solenoid means is provided for moving the pen into engagement with the strip chart. Means is provided for moving the block and the pen carried thereby along the Y-axis and for supplying energy to the solenoid for actuating the pen which includes flexible elongate elements formed of a conducting material which serves two purposes, one of which is to provide the movement of the mounting block and the other of which is to provide a conductor for the electrical energy for energizing the solenoid.

## 3,673,605
## DOOR-LOCK COVER GUARD

Howard M. Allenbaugh, Los Angeles, Calif., assignor to Louis Martin Najera, Norwalk and Charles Russell Goebel, Glendale, Calif., part interest to each

Filed Oct. 14, 1970, Ser. No. 80,593
Int. Cl. E05b 9/08
U.S. Cl. 292—346 2 Claims



A guard to cover both sides and the edge of a door in the area thereof in which the lock is mounted, the same being

adapted to original installation and having particular value in connection with replacement lock sets for modernizing doors the present guard, whether used with original or replacement locks, so covering adjacent door areas as to protect the same and the locks from unauthorized tempering. Also, said guard is formed to cover over mortises and bores of locks being replaced, whether or not such openings are filled in, thereby obviating the need for replacing the door in its entirety.

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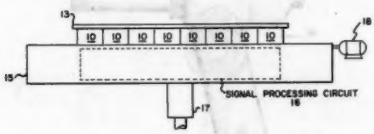
**3,673,606**

**FLUSH MOUNTED STEERABLE ARRAY ANTENNA**

**James J. Maune, Plainview, N.Y., assignor to Hazeltine Corporation**

**Filed Aug. 26, 1969, Ser. No. 853,015**
**Int. Cl. H01q 3/26**
**U.S. Cl. 343—766** **6 Claims**




A rotatable directional antenna which remains flush with the surface on which it is mounted including an array of radiating elements which are arranged in parallel columns. Energy of equal phase is coupled to the elements that comprise each column. The array produces a beam of electromagnetic energy which is steerable within a plane which includes the broadside direction of the array by varying the phase of the energy coupled to each of the columns of elements. The array is rotatable about its broadside axis thereby permitting the plane within which the beam can be steered to rotate about the broadside axis. A region in space can thereby by scanned while the array remains flush with the surrounding surface. Alternate arrangements are also covered.

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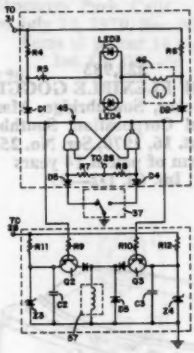
**3,673,607**

**BILLING DEMAND RECORDER**

**James D. Hoeffel, and Reinhold W. Kubach, both of Dayton, Ohio, assignors to Dayton Electronic Products Company, Dayton, Ohio**

**Filed Jan. 20, 1971, Ser. No. 108,088**
**Int. Cl. G01d 13/00; G11b 27/36**
**U.S. Cl. 346—17** **7 Claims**

A recording instrument, such as an electrical power meter, controls the actuation of an electrical switch from one position to another at a rate which is a function of a measured quantity, such as kilowatt hours. The electrical switch controls the direction of current flow through a magnetic recording head so that information representing the measured quantity can be placed on a recording medium. A constant current power supply is provided to insure consistency of information placed on the recording medium independently of line voltage changes, and light emitting diodes are included in series with the magnetic head to show the existence and the direction of current flow through the recording head. Latching flip-flops may also be included between the electrical switch and the recording head to prevent the recording of multiple marks due to switch bounce. Electrically actuated mechanical counters



may also be used to record changes in switch position.

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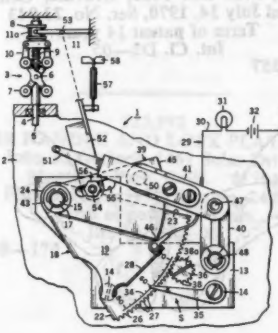
**3,673,608**

**INFORMATION RECORDER**

**Henry Voorman, Jr., Midland Park, N.J., assignor to Wagner Electric Corporation, Newark, N.J.**

**Filed Aug. 25, 1970, Ser. No. 66,808**
**Int. Cl. G01p 1/10**
**U.S. Cl. 346—18** **8 Claims**



An information recorder is provided with a rotatable drive shaft for moving linkage means including a marking member to record the different speeds of drive shaft rotation on a movable chart in said recorder, and an adjustable member is adjustably driven by a manual adjusting member toward a preselected position to predeterminately space a contact thereon connected in an electrical warning circuit from a cooperating contact on said linkage means to thereby define the speed of drive shaft rotation at which said electrical warning circuit is energized.

This invention relates generally to information recorders and in particular to excessive speed indicating mechanisms therefor.

# DESIGNS

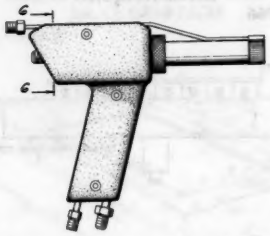
JUNE 27, 1972

223,983
**PAIR OF FLEXIBLE GOGGLES**
George H. Schauweker, Southbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Sept. 16, 1970, Ser. No. 25,024
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—234

223,984
**NECKTIE**
Alfred Krivda, P.O. Box 1055, Oroville, Calif. 95965
Filed July 14, 1970, Ser. No. 23,943
Term of patent 14 years
Int. Cl. D2—*05*
U.S. Cl. D2—357

223,985
**BUCKLE**
Melvin V. Zakarin, 23 Ogden Lane, Englishtown, N.J. 07726
Filed July 14, 1970, Ser. No. 23,945
Term of patent 3½ years
Int. Cl. D2—*07*
U.S. Cl. D2—427

223,986
**ELECTRICAL PLASMA-JET TORCH**
Erich Muehlberger and Robert P. De La Vega, Costa Mesa, Calif., assignors to Geotel, Inc., Amityville, N.Y.
Filed Oct. 12, 1970, Ser. No. 25,429
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—30



223,987
**ELECTRIC SCISSORS**
William L. Gamble, Unionville, Conn., assignor to The Fuller Brush Company, East Hartford, Conn.
Filed Oct. 16, 1970, Ser. No. 25,519
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—61

223,988
**PLUG SPANNER**
Charles C. Robinson, 20 Martindale Ave., Wimborne, England
Filed Aug. 20, 1970, Ser. No. 24,593
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—27

223,989
**DOOR HANDLE AND LOCK PLATE UNIT**
John R. Gerlach, 1461 Solar Drive,
Monterey Park, Calif. 91754
Filed July 29, 1970, Ser. No. 24,201
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—170

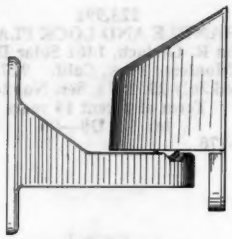
223,990
**DOOR HANDLE AND LOCK PLATE UNIT**
John R. Gerlach, 1461 Solar Drive,
Monterey Park, Calif. 91754
Filed July 29, 1970, Ser. No. 24,202
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—170

223,991
**DOOR HANDLE AND LOCK PLATE UNIT**
John R. Gerlach, 1461 Solar Drive,
Monterey Park, Calif. 91754
Filed July 29, 1970, Ser. No. 24,204
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—170

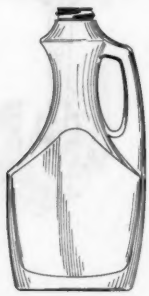
223,992
**DOOR HANDLE AND LOCK PLATE UNIT**
John R. Gerlach, 1461 Solar Drive,
Monterey Park, Calif. 91754
Filed July 29, 1970, Ser. No. 24,205
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—170

223,993
**DOOR KNOCKER**
Ade Bethune, Newport, R.I., assignor to Terra-Sancta Creations, Inc., Philadelphia, Pa.
Original design application Apr. 8, 1970, Ser. No. 22,320, now Patent No. 221,054, dated July 6, 1971. Divided and this application Oct. 30, 1970, Ser. No. 25,733
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—177

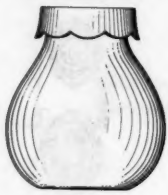
223,994
**COMBINED DOOR HOLDER AND STRIKER**
Henry D. Johnson, New Britain, and Richard H. Russell, Farmington, Conn., assignors to The H. B. Ives Company, New Haven, Conn.
Filed July 23, 1970, Ser. No. 24,096
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—203



223,995
**JUG OR SIMILAR ARTICLE**
Ted L. Beaver, Roselle, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Jan. 4, 1971, Ser. No. 103,933
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—41



223,996
**COMBINED JAR AND LID**
Andre Courreges, Neuilly, France, assignor to Courreges Parfums, Paris, France
Continuation-in-part of design application Ser. No. 21,051, Jan. 23, 1970. This application Feb. 10, 1971, Ser. No. 114,411
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—141



223,997
**BOTTLE**
Kenji Hanamura, Tokyo, Japan, assignor to Tancho Co., Ltd., Osaka, Japan
Filed Dec. 31, 1970, Ser. No. 26,716
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—157

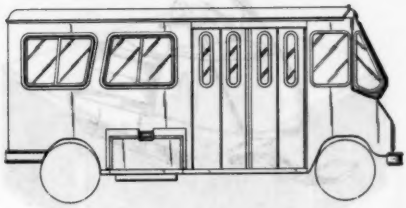
223,998
**MOLDED PACKAGING TRAY FOR MEAT OR THE LIKE**
Richard F. Reifers, New Canaan, Conn., and Kenneth D. Bixler, Huntington, N.Y., assignors to Diamond International Corporation, New York, N.Y.
Filed Jan. 27, 1971, Ser. No. 110,371
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219

223,999
**PACKAGING CUP FOR FOOD OR THE LIKE**
Odo Klose, Wuppertal-Elberfeld, Germany, assignor to Fritz Meckenstock, Wuppertal-Elberfeld, Germany
Filed Nov. 2, 1970, Ser. No. 25,786
Claims priority, application Germany May 2, 1970
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—220

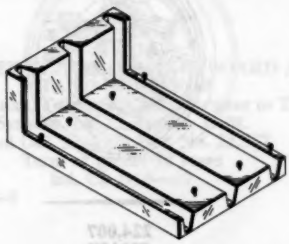
224,000
**STORE FRONT**
Mitchell C. Azar, Sudbury, Mass., assignor to Cambridge Coffee, Tea and Spice House, Charlestown, Mass.
Filed Sept. 21, 1970, Ser. No. 25,122
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1

224,001
**SUBMERGIBLE SEA ROOM**
William Barkley, 3847 Underwood Drive 3, San Jose, Calif. 95117
Filed Nov. 19, 1970, Ser. No. 26,074
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

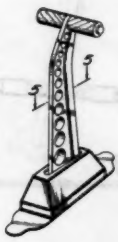
224,002
**ELECTRIC BUS BODY**
Paul R. Hafer, Boyertown, Pa., assignor to Boyertown Auto Body Works, Boyertown, Pa.
Filed Dec. 21, 1970, Ser. No. 26,590
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3



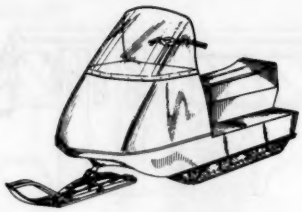
224,003
**PICKUP TRUCK BED SUPPORTED TRAIL BIKE TRANSPORTER**
Irving Dumm III, 8297 Oak Knoll Drive, Roseville, Calif. 95678
Filed Sept. 29, 1970, Ser. No. 25,246
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—6



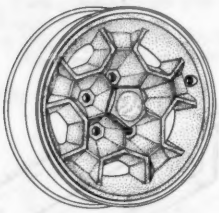
224,004
**COMBINED GEARSHIFT LEVER AND HOUSING FOR AUTOMOBILES**
Robert G. T. Reilly, 13652 Yorba St., Tustin, Calif. 92680
Filed Dec. 28, 1970, Ser. No. 26,663
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—6



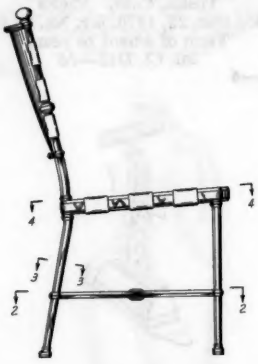
224,005
SNOWMOBILE
Anthony D. MacKeen, Drummondville, Quebec, Canada, assignor to Bombardier Limited, Valcourt, Quebec, Canada
Filed Nov. 2, 1970, Ser. No. 25,771
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D14—24



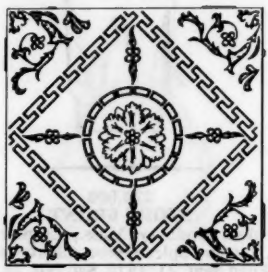
224,006
VEHICLE WHEEL
Maurice P. Chandler, Utica, and William L. Porter, Birmingham, Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Dec. 7, 1970, Ser. No. 26,311
Term of patent 7 years
Int. Cl. D12—*16*
U.S. Cl. D14—30



224,007
CHAIR
John W. Caldwell, 2202 Pinecrest Drive, Altadena, Calif. 91001
Filed July 31, 1970, Ser. No. 24,255
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—1

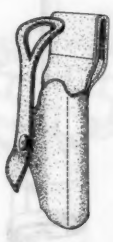



224,008
CERAMIC WALL TILE
Patrick Boris Hopkins, Smithfield, New South Wales, Australia, assignor to Pilkington's Tiles Limited, Swinton, England
Filed Nov. 9, 1970, Ser. No. 25,887
Claims priority, application Great Britain Sept. 23, 1970
Term of patent 7 years
Int. Cl. D25—*01*
U.S. Cl. D18—2

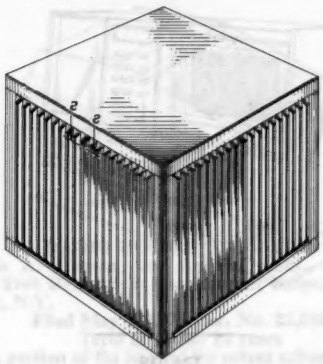


224,009
FISHING WORM
Walter H. Harville, R.R. 1, Henderson, Tenn. 38340, and James M. Harville, R.R. 4, Box 268A, Jackson, Tenn. 38301
Filed Oct. 12, 1970, Ser. No. 25,455
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

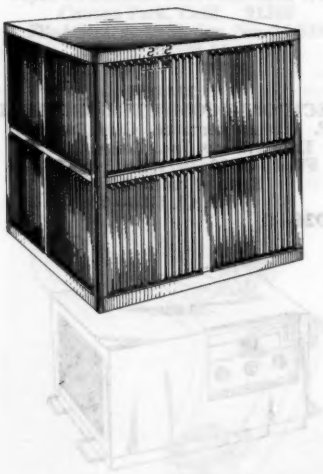
224,010
GUN HOLSTER
Harold A. Barrow, 1612 Cynthia Drive, Rockford, Ill. 61107
Filed Mar. 29, 1971, Ser. No. 129,305
Term of patent 14 years
Int. Cl. D22—*04*
U.S. Cl. D22—13



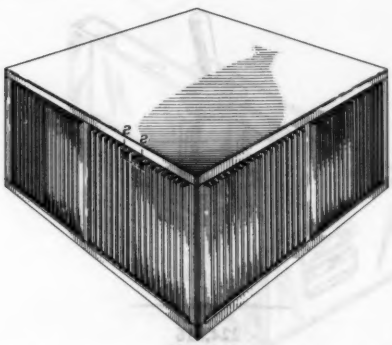
224,011
LOUVERED ENCLOSURE FOR AIR-CONDITIONING EQUIPMENT AND THE LIKE
Adam D. Goettl, 4960 E. Palomino Road, Phoenix, Ariz. 85018
Filed Jan. 25, 1971, Ser. No. 109,756
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—139



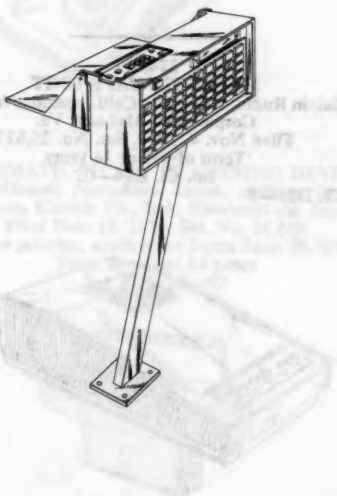
224,012
LOUVERED ENCLOSURE FOR AIR-CONDITIONING EQUIPMENT AND THE LIKE
Adam D. Goettl, 4960 E. Palomino Road, Phoenix, Ariz. 85018
Filed Feb. 8, 1971, Ser. No. 113,796
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—139



224,013
LOUVERED ENCLOSURE FOR AIR-CONDITIONING EQUIPMENT AND THE LIKE
Adam D. Goettl, 4960 E. Palomino Road, Phoenix, Ariz. 85018
Filed Feb. 8, 1971, Ser. No. 113,802
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—139



224,014
COMBINED ELECTRONIC KEYBOARD AND STAND THEREFOR
George F. Minka, Torrance, Calif., assignor to The Data Systems, Inc., Torrance, Calif.
Filed Oct. 19, 1970, Ser. No. 25,557
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

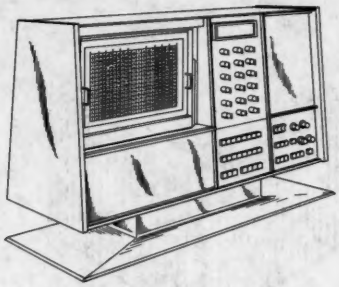


224,015
SWITCH
Norio Nakata, % Nihon Kaiheiki, Kogyo Kabushiki Kaisha, 5–14 Minamimagome 1-chome, Tokyo, Japan
Filed Nov. 2, 1970, Ser. No. 25,775
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13

224,016
SWITCH
Norio Nakata, % Nihon Kaiheiki, Kogyo Kabushiki Kaisha, 5–14 Minamimagome 1-chome, Tokyo, Japan
Filed Nov. 2, 1970, Ser. No. 25,776
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13

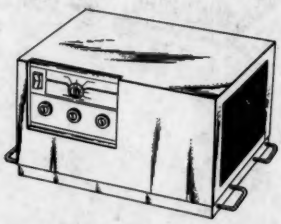
224,017
MAGNETIC TAPE UNIT
Melvin Rudin, Palo Alto, Calif., assignor to Datel Corporation, McLean, Va.
Filed Nov. 4, 1970, Ser. No. 25,827
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

224,018
COMPUTER
John E. Studer, Jr., Flemington, N.J., assignor to Electronic Associates Inc., Long Branch, N.J.
Filed Dec. 10, 1970, Ser. No. 26,393
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

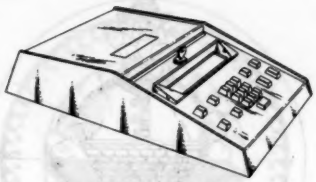


224,019
SEND/RECEIVE DATA PRINTER TERMINAL OR SIMILAR ARTICLE
Robert E. Kalvitis, Fairport, and Robert H. Van Valkinburgh, Pittsford, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Dec. 14, 1970, Ser. No. 26,428
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

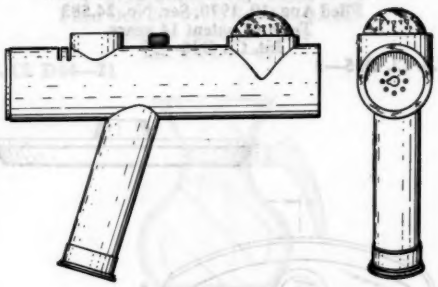
224,020
ELECTRONIC COMPUTER OR THE LIKE
George F. Minka, Torrance, Calif., assignor to TRW Data Systems, Inc., Torrance, Calif.
Filed Jan. 20, 1971, Ser. No. 108,235
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



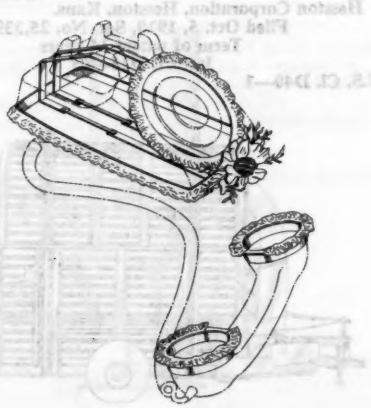
224,021
KEYBOARD TERMINAL OR THE LIKE
George F. Minka, Torrance, and Frank E. Bustamante, Culver City, Calif., assignors to TRW Data Systems, Inc., Torrance, Calif.
Filed Jan. 20, 1971, Ser. No. 108,236
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



224,022
RADIO DIRECTION FINDER
Maurice A. Warren, Los Angeles, Calif., assignor to Vec/Trak Research & Development Corporation, New York, N.Y.
Filed May 7, 1970, Ser. No. 22,868
Term of patent 14 years
The portion of the term of the patent subsequent to Jan. 19, 1985, has been disclaimed
Int. Cl. D14—*03*
U.S. Cl. D26—14

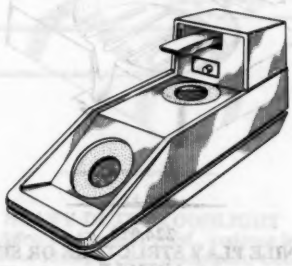


224,023
PHONE DECORATION
Joyce G. Cliburn, 20201 Sherman Way, Canoga Park, Calif. 91306
Filed Sept. 4, 1970, Ser. No. 24,835
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



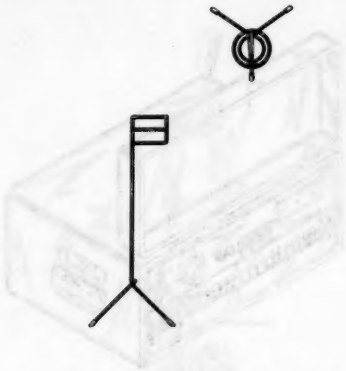
224,024
OUTGOING TRUNK EXTENDER APPARATUS FOR TELEPHONE OFFICE EQUIPMENT
Paul V. De Luca, Port Washington, N.Y., assignor to Porta Systems Corp., Port Washington, N.Y.
Filed Nov. 12, 1970, Ser. No. 25,945
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

224,025
ACOUSTIC COUPLER OR SIMILAR ARTICLE
Larry D. Harrison, Clifton Springs, and Robert E. Kalvitis, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Dec. 14, 1970, Ser. No. 26,431
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

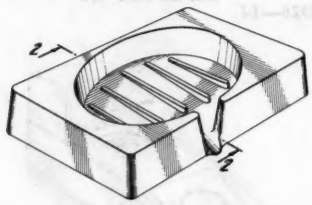


224,026
AUTOMATIC TICKET EXAMINING DEVICE
Tatsuya Mikami, Narashino, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed Dec. 17, 1970, Ser. No. 26,550
Claims priority, application Japan June 18, 1970
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D28—1

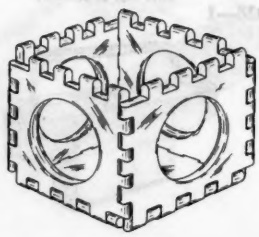
224,027
**SUPPORT STAND FOR AN AIR SPRAYING CONTAINER**
Oliver W. Hildebrand, Florissant, Mo., assignor to Wirecraft Mfg. Company, St. Louis, Mo.
Filed Apr. 9, 1970, Ser. No. 22,354
Term of patent 7 years
Int. Cl. D6—*99*
U.S. Cl. D33—3



224,028
**SOAP RECEPTACLE**
Joseph J. Settle, 1319 N. Fashion Lane 1, Anaheim, Calif. 92806
Filed Nov. 27, 1970, Ser. No. 26,182
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D33—24

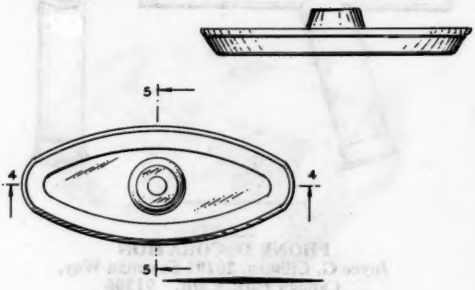


224,029
**JUVENILE PLAY STRUCTURE OR SIMILAR ARTICLE**
John A. Gale, Wayzata, Minn., and James V. Young, St. Louis, and William Kenneth Menke, Glendale, Mo., assignors to Learning Products, Inc., Maryland Heights, Mo.
Filed Aug. 28, 1970, Ser. No. 24,759
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5

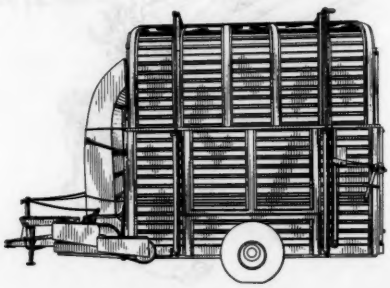


224,030
**BEAR FIGURE DEVICE FOR HOLDING TOYS, CLOTHING OR THE LIKE**
James F. Eden, 312 Three Oaks Road, Cary, Ill. 60013
Filed Nov. 16, 1970, Ser. No. 26,022
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

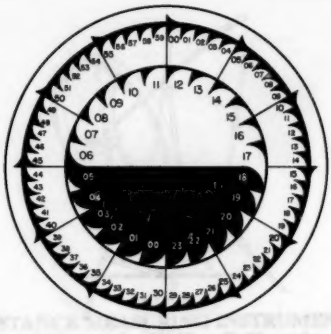
224,031
**HOLDER FOR AN ARTIFICIAL AQUARIUM PLANT**
Allan H. Willinger, New Rochelle, N.Y., assignor to Metaframe Corporation, Maywood, N.J.
Filed Aug. 19, 1970, Ser. No. 24,583
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D35—3




224,032
**HAY LOADING AND STACKING IMPLEMENT**
Raymond A. Adee, Newton, Dean P. Brooks, Hesston, and John D. Anderson, Canton, Kans., assignors to Hesston Corporation, Hesston, Kans.
Filed Oct. 5, 1970, Ser. No. 25,339
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1



224,033
CLOCK FACE
Richard A. Strong and Rosa M. Strong, Temple Hills, Md. (both % Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio 45433)
Filed Nov. 5, 1970, Ser. No. 25,841
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1

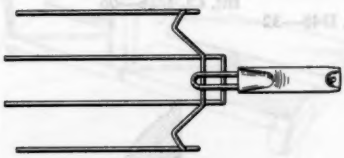


224,034
CARAFE OR SIMILAR ARTICLE
David Douglas, 1119 Lincoln Blvd., Manitowoc, Wis. 54220
Filed Oct. 23, 1970, Ser. No. 25,629
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—21

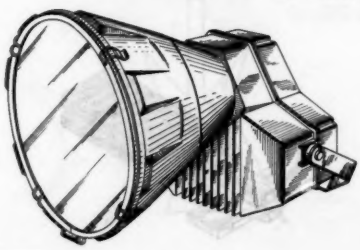
224,035
GOBLET OR SIMILAR ARTICLE
David Douglas, 1119 Lincoln Blvd., Manitowoc, Wis. 54220
Filed Oct. 12, 1970, Ser. No. 25,443
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D36—8

224,036
FINDING FOR A BROOCH OR THE LIKE
Maurice C. Faldborg, 29869 Marine View Drive, Federal Way, Wash. 98002
Filed Aug. 5, 1970, Ser. No. 24,588
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—19

224,037
HOT TRAY LIFTER
James Demetreon, 5704 Hillside Drive, Kansas City, Mo. 64151
Filed Oct. 12, 1970, Ser. No. 25,452
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—4

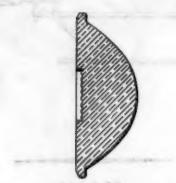


224,038
HEAVY DUTY FLOODLIGHT
Tarek B. Adra, La Canada, Calif., assignor to Harvey Hubbel Incorporated, Bridgeport, Conn.
Filed Nov. 5, 1970, Ser. No. 25,844
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D48—20

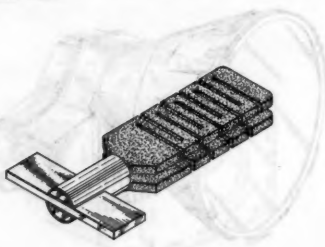


224,039
**LIGHT STANDARD OR SIMILAR ARTICLE**
Robert W. Selden, Seattle, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.
Filed Sept. 21, 1970, Ser. No. 25,096
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31

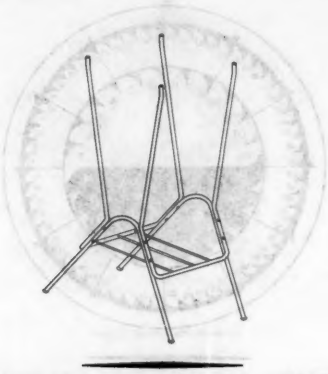
224,040
**FLUTED PLANOASPHERIC LENS**
Howard Albert Schaefer, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Feb. 25, 1970, Ser. No. 21,604
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32



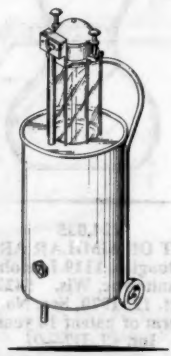
224,041
**IGNITER OR SIMILAR ARTICLE**
Stanley J. Matys, Lancaster, N.Y., assignor to Igniters, Inc., Lancaster, N.Y.
Filed Oct. 19, 1970, Ser. No. 25,556
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—129



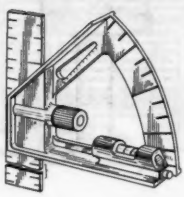
224,042
**COMBINED APPAREL RACK AND LAUNDRY BAG SUPPORT STAND**
Richard A. Van Voorhis, 2159 Hillside Circle, Birmingham, Ala. 35209
Filed Jan. 20, 1970, Ser. No. 21,001
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D49—8.1



224,043
**OIL CHANGER**
Livio Billos, Woodbury, N.J., assignor to Sherman Car Wash Equipment Co., Palmyra, N.J.
Filed June 25, 1970, Ser. No. 23,666
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D52—2



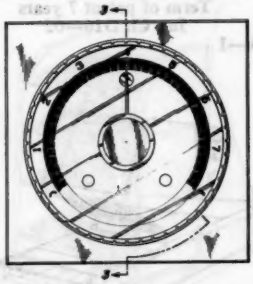
224,044
**COMBINED TRY AND MITER SQUARE**
Ronald David Carter, Leamington Spa, England, assignor to Stanley Works (Great Britain) Limited, Woodside, Sheffield, England
Filed Oct. 5, 1970, Ser. No. 25,346
Claims priority, application Great Britain Apr. 17, 1970
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—6



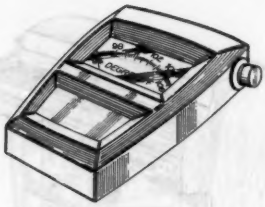
224,045
**DISTANCE MEASURING INSTRUMENT**
Wallace D. Evans, Jr., Malibu, Calif., assignor to Rolatape Corporation, Santa Monica, Calif.
Filed Jan. 21, 1971, Ser. No. 108,672
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—6

224,046
**DISTANCE MEASURING INSTRUMENT**
Wallace D. Evans, Jr., Malibu, Calif., assignor to Rolatape Corporation, Santa Monica, Calif.
Filed Jan. 21 ,1971, Ser. No. 108,679
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—6

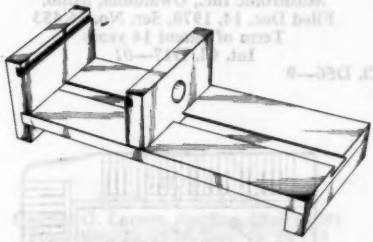
224,047
**INDICATING CONDITION CONTROLLER**
Lyman L. Hill, Jr., 1995 Summit Ave., St. Paul, Minn. 55105; James A. Odom, Jr., 874 66th Ave. N., Brooklyn Center, Minn. 55430; and Norbert T. Wolfe, 5348 10th Ave. S., Minneapolis, Minn. 55417
Filed Feb. 16, 1970, Ser. No. 21,448
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—7



224,048
**ELECTRONIC CLINICAL THERMOMETER**
Douglas M. Bauer, Danvers, and Mark S. Mazzetti, Marblehead, Mass., assignors to Meditech Energy and Environmental Corporation, Danvers, Mass.
Filed Nov. 9, 1970, Ser. No. 25,885
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D52—7

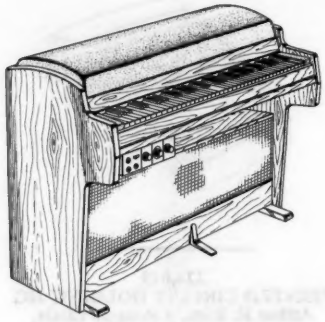


224,049
**PRINTED CIRCUIT HOLDING JIG**
Arthur R. Rose, 3 Rodgers Circle, North Reading, Mass. 01864
Filed Oct. 5, 1970, Ser. No. 25,324
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D54—13

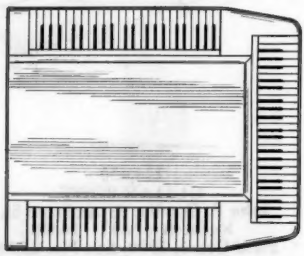


224,050
**GUITAR BODY**
John P. Gaudio, 73 Ambrose St., Rochester, N.Y. 14608
Filed Oct. 7, 1970, Ser. No. 25,367
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1

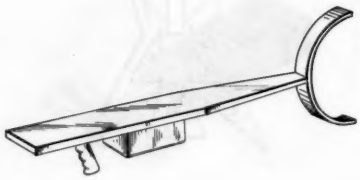
224,051
**ELECTRIC PIANO**
Harold B. Rhodes, Anaheim, Calif., assignor to Columbia Broadcasting System, Inc., New York, N.Y.
Filed May 11, 1970, Ser. No. 22,920
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D56—2



224,052
**MULTIPLE KEYBOARD UNIT**
Percy Dean Olson, Owatonna, Minn., assignor to Musitronic Inc., Owatonna, Minn.
Filed Dec. 14, 1970, Ser. No. 26,453
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D56—9



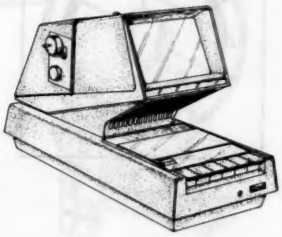
224,053
**CAMERA SUPPORT**
Leo Stein, P.O. Box 1063, F.D.R. Station, New York, N.Y. 10022
Filed Aug. 10, 1970, Ser. No. 24,403
Term of patent 14 years
Int. Cl. D16—*99*
U.S. Cl. D61—1



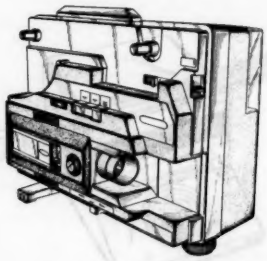
224,054
**XEROGRAPHIC REPRODUCTION MACHINE OR THE LIKE**
Dan R. Derby, Cupertino, Calif., and Ruediger W. Knodt, Rochester, and Homer Korn, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Sept. 21, 1970, Ser. No. 25,070
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1

224,055
**CAMERA FLASH ATTACHMENT**
Peter T. Quinn, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Dec. 23, 1970, Ser. No. 26,623
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D61—1

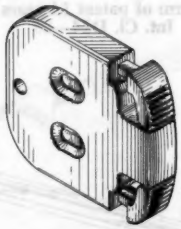
224,056
**REAR PROJECTION SLIDE VIEWER**
Noboru Onozaki and Masaaki Furukawa, Tokyo, and Teruo Yotsukura, Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 11, 1971, Ser. No. 114,746
Claims priority, application Japan Sept. 11, 1970
Term of patent 7 years
Int. Cl. D16—*02*
U.S. Cl. D61—1



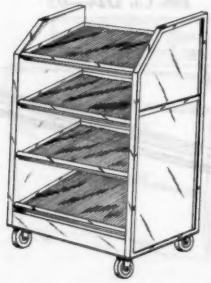
224,057
**MOTION PICTURE PROJECTOR**
Yoh Tanaka, Tokyo, Japan, assignor to Fuji Shashin Film Kabushiki Kaisha, Kanagawa-ken, Japan
Filed Feb. 16, 1971, Ser. No. 115,921
Claims priority, application Japan Aug. 19, 1970
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1



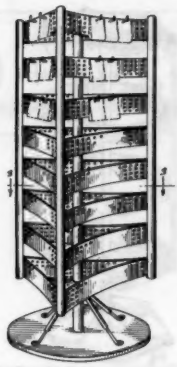
224,058
**HAND COUNTER**
Earl Rudduck, 5616 E. Argyle Drive, Phoenix, Ariz. 85018
Filed Feb. 18, 1971, Ser. No. 116,732
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11



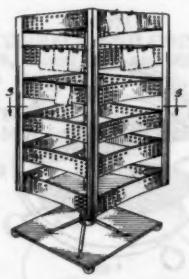
224,059
**MOBILE DISPLAY CART**
Melvin O. Maisak, Florissant, and William H. Fullington, Ballwin, Mo., assignors to Pet Incorporated, St. Louis, Mo.
Filed June 11, 1969, Ser. No. 17,654
Term of patent 14 years
Int. Cl. D6—*06;* D12—*02*
U.S. Cl. D80—9



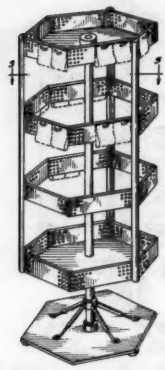
224,060
**DISPLAY STAND**
Charles O. Larson, Sterling, Ill. 61081
Filed Nov. 23, 1970, Ser. No. 26,107
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D80—9



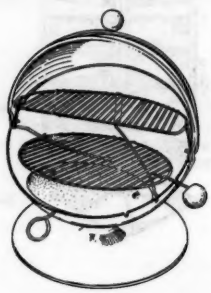
224,061
**DISPLAY STAND**
Charles O. Larson, Sterling, Ill. 61081
Filed Nov. 23, 1970, Ser. No. 26,110
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D80—9



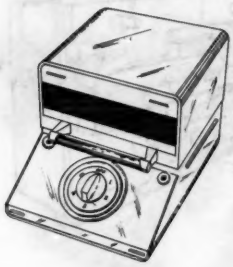
224,062
DISPLAY STAND
Charles O. Larson, Sterling, Ill. 61081
Filed Nov. 23, 1970, Ser. No. 26,111
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D80—9



224,063
COOKING DEVICE
William H. Wiggins, 137 Willowdale Ave., Toronto, Ontario, Canada
Filed May 26, 1969, Ser. No. 17,333
Term of patent 14 years
The portion of the term of the patent subsequent to Aug. 27, 1982, has been disclaimed
Int. Cl. D7—*02*
U.S. Cl. D81—10



224,064
WARMING OVEN
Clarence F. Marquart, Washington, Mo., assignor to Landshire Products, Inc., St. Louis, Mo.
Filed Mar. 23, 1970, Ser. No. 22,014
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D81—10



224,065
DIAGNOSTIC CLINICAL INSTRUMENT HAVING SUPPORTING MEANS
Bernard McDonald, Malibu, Calif., assignor to Medical Testing Systems, Inc., Beverly Hills, Calif.
Filed Mar. 11, 1971, Ser. No. 123,489
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D83—12

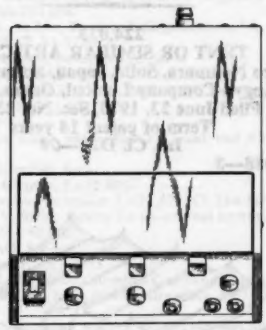
224,066
DIAGNOSTIC CLINICAL INSTRUMENT
Bernard McDonald, Malibu, Calif., assignor to Medical Testing Systems, Inc., Beverly Hills, Calif.
Filed Mar. 11, 1971, Ser. No. 123,490
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D83—12

224,067
**DIAGNOSTIC CLINICAL INSTRUMENT**
Bernard McDonald, Malibu, Calif., assignor to Medical Testing Systems, Inc., Beverly Hills, Calif.
Filed Mar. 11, 1971, Ser. No. 123,491
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D83—12

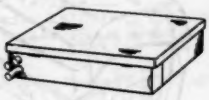
224,068
**DIAGNOSTIC MULTIPLE CLINICAL INSTRUMENT**
Bernard McDonald, Malibu, Calif., assignor to Medical Testing Systems, Inc., Beverly Hills, Calif.
Filed Mar. 22, 1971, Ser. No. 127,068
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D83—12

224,069
**LIQUID SCINTILLATION SPECTROMETER FOR DETERMINING RADIOACTIVITY LEVELS IN TEST SAMPLES**
Frederick W. Thompson, Northfield, Ill., assignor to Packard Instrument Company, Inc., Downers Grove, Ill.
Filed Apr. 9, 1970, Ser. No. 22,344
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1

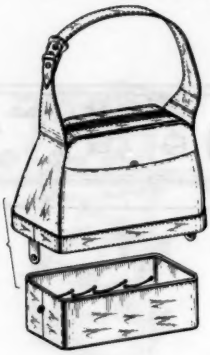
224,070
**ELECTROSURGICAL UNIT**
Ulises M. Lopez, West Hempstead, Martin I. Septimus and Henry A. Holzwarth, New York, and John D. Wark, Freeport, N.Y., assignors to Cavitron Corporation, Long Island City, N.Y.
Filed Dec. 7, 1970, Ser. No. 26,318
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1



224,071
**COMBINED COMPACT AND COIN CONTAINER**
Suvad Hatibovich, Murat Hot, and Rifat Hot, all of 26 Charles Veale Drive, West Beach, South Australia, Australia
Term of patent 14 years
Filed May 6, 1970, Ser. No. 22,844
Int. Cl. D28—*02*
U.S. Cl. D86—10



224,072
**COMBINED COSMETIC AND TOTE BAG**
Julia Raymond Rosenblum, 6 W. 77th St., New York, N.Y. 10024
Filed Apr. 16, 1970, Ser. No. 22,462
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—3



224,073
**TENT OR SIMILAR ARTICLE**
Ryotaro Nohmura, Suita, Japan, assignor to Taiyo Kogyo Company Limited, Osaka, Japan
Filed June 23, 1970, Ser. No. 23,623
Term of patent 14 years
Int. Cl. D21—*04*
U.S. Cl. D88—3

224,074
**MOTORCYCLE SADDLE BAG**
Theodore S. Harmon, Jr., 100A Dahlgen Ave., Portsmouth, Va. 23702
Filed June 8, 1970, Ser. No. 23,365
Term of patent 14 years
Int. Cl. D12—*16*
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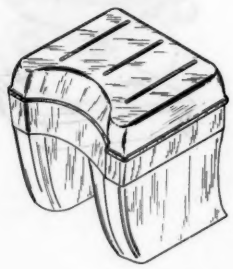
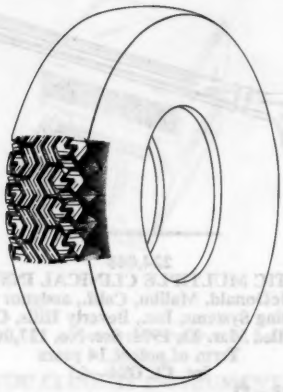


224,075
**PNEUMATIC TIRE**
James F. Newman, St. Clair Shores, Mich., assignor to Uniroyal, Inc., New York, N.Y.
Filed Sept. 3, 1970, Ser. No. 24,819
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



224,076
**SIGN**
Jack A. McMillan, Oklahoma City, Okla., assignor to Circustine, Inc., Oklahoma City, Okla.
Filed Dec. 14, 1970, Ser. No. 26,469
Term of patent 14 years
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U.S. Cl. D96—12

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Cressman, Russell N.; Bantz, Walter J.; and Nusbickel, Edward M., Jr., 3,672,210.

Barber, Wayland F. Expandable collar clasp. 3,672,005, Cl. 24-81.00d.

Barber, Wayne, to Microwave Development Laboratories, Inc. Method of making waveguide bend. 3,672,202, Cl. 72-369.

Barber-Colman Company: *See—*
Horton, Alfred A., 3,673,479.

Barbera, Anthony J., to United States of America, National Aeronautics and Space Administration. Use of unilluminated solar cells as shunt diodes for a solar array. 3,672,999; Cl. 136-89.000.

Barbier, Jean-Pierre; and Feugnet, Jean-Pierre, to Bridel, Laiteries E. Installation for production of soft and washed-curd cheeses. 3,672,056, Cl. 31-49.000.

Barbul, Marius-Aurel: *See—*
Georgescu, Eugenia; Gheja, Ion; Bugur, Victor; Zirna, Ion; Mazare, Theodora; Popescu, Elena-Lygia; Olteanu, Bujor; Marculescu, Nicolae; Filotti, Traian-Mircea; Barbul, Marius-Aurel; and Calin, Ion, 3,673,109.

Barfield, C. Verne: *See—*
Crovella, Edward A.; and Barfield, C. Verne, 3,672,353.

Barg, Dora A. Paint cases, palette, and conveyor. 3,672,742, Cl. 312-232.000.

Barnbrook, Thomas George; and Wren, Frederick James, to Timken Company, The. Method of adjusting rolling bearings. 3,672,019, Cl. 29-148.40a.

Barr, John E., to International Telephone and Telegraph Corporation. Connector clip removal tool. 3,672,024, Cl. 29-203.00h.

Barrera, Roberto Gonzalez: *See—*
Rubio, Manuel Jesus, 3,672,912.

Barrett Haentjens & Co.: *See—*
Werner, Roy H., 3,672,512.

Barrett, Robert W.; and Preese, Pat S., to Current Industries, Incorporated. Intruder detector. 3,673,589, Cl. 340-258.00d.

Barsh, Max K.; and Edwards, James N., to Aerojet-General Corporation. Vehicle alerting system. 3,673,560, Cl. 340-33.

Bartok, Stephen: *See—*
Dubreuil, Philip B.; Bartok, Stephen; and Crawford, William R., 3,672,408.

Bartok, Stephen; Kamenir, Melvin; and Begoss, Andrew J., to Litton Business Systems, Inc. Magnetic transducer armature. 3,673,350, Cl. 179-100.20c.

Baruch, John J. Liquid level indicator having an adjustable float. 3,673,587, Cl. 340-244.00a.

Basche, Lorraine A. Face lifting band. 3,672,362, Cl. 128-76.00b.

Bastikar, Arvid Ramkrishnarao, to Northern Electric Company Limited. Microwave balanced external cavity rejection filter. 3,673,522, Cl. 333-73.00w.

Bates, Marcus L. Method of feeding and watering animals. 3,672,333, Cl. 119-51. 500.

Battelle Development Corporation, The: *See—*
Hinshaw, John W., 3,672,201.
Mitchell, Robert K., 3,672,796.
Sagmuller, Joseph R.; and Hunter, Richard I., 3,672,882.

Bauer, George T., to Xerox Corporation. Illumination control system. 3,672,759, Cl. 355-3.000.

Bauer, James J.; Werner, James L.; and Erickson, Leland E. Quick attachment device. 3,672,521, Cl. 214-145.000.

Bauer, Rudolf; Jacob, Herbert; and Braun, Werner, to Wacker-Chemie G.m.b.H. Packaging epitaxially coated semiconductor disks. 3,672,495, Cl. 206-65.00f.

Baukhage, Ernest Peter. Safety turntable for a ski binding. 3,672,695, Cl. 280-11.35k.

Baum, Werner, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Method of feeding liquid propellants to gas generators or rocket combustion chambers and feeding system for performing the method. 3,672,165, Cl. 60-39.480.

Bausch & Lomb Incorporated: *See—*
Sheld, Clarence A., 3,673,055.

Bausch & Lomb Incorporated, mesne: *See—*
Akin, Alfred A., Jr., 3,672,782.

Baxter Laboratories, Inc.: *See—*
Schlutz, Charles A.; and Bellamy, David, Jr., 3,672,564.

Baxter, Larry K., to Shintron Company, Inc. Facsimile transmission system. 3,673,322, Cl. 178-6.000.

Baycura, Orestes M. Magnetic square wave voltage generator. 3,673,491, Cl. 323-48.000.

Beam, Norman A.: *See—*
Murphy, Willard; and Beam, Norman A., 3,672,080.

Beanston, Robert A.: *See—*
Stefansson, Rafn; and Beanston, Robert A., 3,673,602.

Beaumont, Alan. Tape cartridge including direct viewing of cue indicia. 3,672,604, Cl. 242-199.000.

Bechtel International Corporation: *See—*
Stephansen, Erik W., 3,672,066.

Beck, Fritz; and Csizi, Gotthard, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of electrodes. 3,672,990, Cl. 117-230.000.

Beck, Jacob C., to Safety Devices, Inc. Safety apparatus. 3,672,466, Cl. 182-3.000.

Becker, Ernst; and Notz, Karl. Apparatus for joint control of a clutch and electrical switches. 3,672,316, Cl. 112-219.00a.

Becker, Phillip D., to Buell Industries, Incorporated. High tolerance hole-plug for sheet metal. 3,672,532, Cl. 220-25.000.

Beerli, George: *See—*
Ackerman, Joseph Francis; Weisfeld, Joseph; Savageau, Robert George; and Beerli, George, 3,673,140.

Beges AG: *See—*

Geschka, Hugo Werner; Oberhoff, Wolfgang; and Korb, Klaus, 3,672,188.

Begoss, Andrew J.: *See*—
Bartok, Stephen; Kamenir, Melvin; and Begoss, Andrew J., 3,673,350.

Behr, Erich, to Dynamit Nobel AG. Thermostable polyesters and process of producing same. 3,673,153, Cl. 260-47.00c.

Beisswenger, Heinrich, to Alkem Alpha-Chemie und-Metallurgie G.m.b.H. Mixing apparatus for powdered nuclear fuel. 3,672,642, Cl. 259-50.000.

Belden Corporation: *See*—
Cornish, Rodney H.; Staulcup, James T.; and Chaney, Richard M., 3,672,426.
Lasley, James A., 3,673,315.

Bell & Howell Company: *See*—
Stefansson, Rafn; and Beanston, Robert A., 3,673,602.

Bell Telephone Laboratories, Incorporated: *See*—
Clark, James E., 3,672,034.
Coleman, Donald James, Jr.; and Sze, Simon Min, 3,673,514.
Corby, William Joseph; Garbarini, Victor Charles; and White, Malcolm Lunt, 3,673,099.
Joel, Amos Edward, Jr., 3,673,335.
Korn, Franklin Adam, 3,673,339.
La Marche, Robert Ernest; and May, Carl Jerome, Jr., 3,673,355.
Lowry, Terrell Nicholson, 3,673,524.
Molchan, Andrew John, 3,673,357.
Van Dine, Gilbert August, 3,673,519.

Bell, William Roland. Method for extracting honey. 3,671,985, Cl. 6-12.00a.

Bellamy, David, Jr.: *See*—
Schlutz, Charles A.; and Bellamy, David, Jr., 3,672,564.

Bellis, Harold Edward, to Du Pont de Nemours, E. I., and Company. Plating on aluminum, magnesium or zinc. 3,672,964, Cl. 204-33.000.

Bemberg S.p.A.: *See*—
Callieri, Michele; Faraci, Giorgio; and Paracchini, Mario, 3,672,147.

Ben Daniel, David J.; Fielding, John O.; and Hurwitz, Henry, Jr., to General Electric Company. Audio reproducing apparatus for random access playback systems. 3,672,687, Cl. 274-9.0ra.

Bendix Corporation, The: *See*—
Mayer, Endre A.; and Teitelbaum, Bernard R., 3,672,474.
Moorman, Charles J.; and Reuter, Fred A., 3,673,405.

Bendixen, Knud Erik, to Aktieselskabet Burmeister & Wain's Maskin-OG Skibsbyggeri. Fuel burner unit for mounting in a common air box. 3,672,812, Cl. 431-89.000.

Benedetti, Franco: *See*—
Prijn, Cornelis; and Benedetti, Franco, 3,673,453.

Bennett, Charles H., to Koehring Company. Die casting mold. 3,672,437, Cl. 164-265.000.

Bense, William M., to Leesona Corporation. Strand control apparatus. 3,672,588, Cl. 242-45.000.

Benson, Gustav E.; and Pisani, James M., to Owens-Corning Fiberglas Corporation. Sewn tire cord splice and method. 3,672,148, Cl. 57-159.000.

Benson, Royal H., to Monsanto Company. Liquid scintillator compositions for gamma-ray counting. 3,673,100, Cl. 252-301.30r.

Bentsen, Louis J.: *See*—
Smead, Robert G.; and Bentsen, Louis J., 3,672,569.

Berbner, Heinz: *See*—
Trieschmann, Hans-Georg; Unterstenhoefer, Leo; and Berbner, Heinz, 3,673,141.

Berens, Alfred S., to Federal-Mogul Corporation. Bidirectional Hydrodynamic shaft seal. 3,672,690, Cl. 277-134.000.

Berg, Peter; and Linder, Bertil C., to Cartridge Television, Inc., mesne. Rotary head assembly for tape transport with amplifier carried by the rotor. 3,673,349, Cl. 179-100.20t.

Berg, Robert H. Method of mounting disks in glass walls heat working only once. 3,672,858, Cl. 65-43.000.

Berger, Abe: *See*—
Holub, Fred F.; Berger, Abe; and Selin, Terry G., 3,673,155.

Berger, Leonard; Fitzpatrick, William E.; McGinley, James H.; Pfund, Adolf; and Schwartzberg, Ira G., to International Playtex Corporation. Bag holder and expander unit. 3,672,122, Cl. 53-384.000.

Bergeron, Gaetan G. Service visual indicator and movable currency drawer. 3,672,081, Cl. 40-70.000.

Bergey, John M.; and Walton, Richard S., to Hamilton Watch Company. Solid state watch. 3,672,155, Cl. 58-50.00r.

Berglund, Neil C.; King, Robert W.; and Swearingen, Kent W., to International Business Machines Corporation. Printing control device in high speed chain printer with hammers movable to plural print positions. 3,672,297, Cl. 101-93.00c.

Bergqvist, Claes Bertil: *See*—
Carlen, Jan-Christer Henric Ovesson; and Bergqvist, Claes Bertil, 3,672,877.

Beringer, Monique: *See*—
Buchmann, Paul; and Beringer, Monique, 3,672,509.

Berkeley Steel Construction Company, Inc.: *See*—
White, Jessie N.; and Roseby, Bernard, 3,672,790.

Berler, Robert M., to Pitney Bowes-Alpex, Inc. Hand held photo-optical reader for printed documents. 3,673,416, Cl. 250-219.0dc.

Bernstein, Arthur. Ice bank heat exchanger. 3,672,183, Cl. 62-139.000.

Berry, Robert E.; Bissett, Owen W.; Wagner, Charles J., Jr.; and Patterson, Eldridge P., to United States of America, Agriculture. Method of densifying food products. 3,672,909, Cl. 99-1.000.

Berry, William R.; Drews, Reinhold A.; and Grau, Julius J., to Whirlpool Corporation. Lockout for portable appliance with caster jack mechanism. 3,673,592, Cl. 340-283.000.

Bertolet, Doris Y. Prolonged bed care frame. 3,671,983, Cl. 5-82.000.

Bethlehem Steel Corporation: *See*—
Cressman, Russell N.; Bantz, Walter J.; and Nusbickel, Edward M., Jr., 3,672,210.
Hoffman, John P.; and Booth, Robert C., 3,673,493.
Stelts, Philip D.; and Kern, David W., 3,672,222.

Bialous, Charles, to General Electric Company. Fluorinated polyolefin modified flame retardant polycarbonate composition. 3,673,278, Cl. 260-873.000.

Bickel, Fay D.: *See*—
McConnell, Alexander; and Bickel, Fay D., 3,672,389.

Bickert, Herbert W., to United States of America, Navy, mesne. Power recovery circuit. 3,673,511, Cl. 330-44.000.

Biechl, Josef; and Konrath, Karl, to Bosch, Robert, G.m.b.H. Centrifugal regulator system for fuel-injection combustion engines. 3,672,343, Cl. 123-140.0mc.

Biegler, Hanns: *See*—
Kallrath, Gottfried; Knorre, Helmut; Meyer-Simon, Eugen; and Biegler, Hanns, 3,672,937.

Bienert, Walter B.; Levedahl, William J.; and Streb, Alan J., to Teledyne, Inc., mesne. Thermal control and power flattening for radioisotopic thermodynamic power system. 3,672,443, Cl. 165-32.000.

Biggs, Paul G., to Western Geophysical Company of America. Two-level depth controllers for seismic streamer cables. 3,673,556, Cl. 340-7.000.

Billarant, Patrick. Flexible bands fitted with hooks for the fabrication of separable fastening devices. 3,673,301, Cl. 264-163.000.

Binsack, Rudolf: *See*—
Tacke, Peter; Binsack, Rudolf; and Weissel, Oskar, 3,673,123.

Bissett, Owen W.: *See*—
Berry, Robert E.; Bissett, Owen W.; Wagner, Charles J., Jr.; and Patterson, Eldridge P., 3,672,909.

Black and Decker Manufacturing Company, The: *See*—
Duran, Raymond J.; and Musch, Gordon F., 3,672,139.

Blackmer, David E.: *See*—
Rosse, Thomas A.; and Blackmer, David E., 3,672,843.

Blackstone Corporation: *See*—
Hale, Everett W.; Hawkinson, Paul H.; and Robbeloth, Edward T., 3,672,653.

Blackwell, John Francis: *See*—
Tomica, Alojzy; and Blackwell, John Francis, 3,672,141.

Blackwell, Lyman L., to Statitrol Corporation. Resistance controlled timed pulse generator. 3,673,586, Cl. 340-237.00s.

Blake, Carl B.; and Tung, George K. L., to Frye Industries, Inc., mesne. Printing ink. 3,673,135, Cl. 260-17.00a.

Blakeslee, A. Eugene; Foster, Luther M.; and Plaskett, Thomas S., to United States of America, Army. Method of eliminating copper contamination. 3,673,064, Cl. 204-147.000.

Blakey, Roy, to Girling Limited. Vehicle braking systems. 3,672,729, Cl. 303-9.000.

Blanc de la Naulte, Philippe; and Ginhoux, Roland, to Comptoir Europeen de Distribution et de Representation. Method for manufacturing articles made of flexible plastic. 3,673,030, Cl. 156-193.000.

Blanchette, Robert G.: *See*—
Baltazzi, Evan S.; Blanchette, Robert G.; and Minnis, Ralph L., 3,672,889.

Bland, Peter Douglas: *See*—
Brian, Robert Coles; and Bland, Peter Douglas, 3,673,087.

Blank, Wilbur L. Trailing wheel structure for vehicle-drawn implement. 3,672,701, Cl. 280-414.500.

Blatt, Leland Francis; and Wiesenhofer, Frank H. Gas exhaust silencer. 3,672,465, Cl. 181-50.000.

Bleh, Otto: *See*—
Dijkhuizen, Willem; Termin, Erich; Bleh, Otto; and Morgenstern, Dieter, 3,673,159.

Bliley, Ward L., to International Telephone and Telegraph Corporation. Fully insulated quick disconnect. 3,673,549, Cl. 339-220.00r.

Blixrud, John O.; Knigge, Wayne I.; Rustad, Stanley C.; and Tsuchiya, Takuzo, to General Mills, Inc. Apparatus for treating granular material. 3,672,294, Cl. 99-237.00r.

Block, Jacob: *See*—
McKenney, Robert Lee, Jr.; and Block, Jacob, 3,673,101.

Bloemer, John W., to Eaton Yale & Towne, Inc. Automatic precharge adjuster. 3,672,402, Cl. 138-31.000.

Bly, Ray E., to Coors, Adolph, Company. Plastic closure for containers. 3,672,527, Cl. 215-41.000.

Bock, Gustav, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of pyranthrones. 3,673,220, Cl. 260-360.000.

Bodenseewerk Perkin-Elmer & Co. GmbH: *See*—
Frank, Peter; Jentzsch, Dietrich; and Kurger, Helmut, 3,672,227.

Bodine, Albert G. Elastomeric piston. 3,672,643, Cl. 259-72.000.

Boecker, Alfons Bernhard: *See*—
Von Der Eltz, Hans-Ulrich; Jeths, Johannes; and Boecker, Alfons Bernhard, 3,672,815.

Boehringer Ingelheim G.m.b.H.: *See*—
Schromm, Kurt; Mentrup, Anton; Zeile, Karl; Renth, Ernst-Otto; Engelhardt, Albrecht; and Traunecker, Werner, 3,673,187.

Boixen, Heinz: *See—*
Junk, Dieter; Schlunke, Jurgen; and Boixen, Heinz, 3,672,018.

Bojic, Milan; and Jorre, Daniel, to Institut de Recherches de la Siderurgie Francaise. Apparatus for spectral analysis of molten substances. 3,672,774, Cl. 356-86.000.

Boling, Monte J., to Anderson Machine Works. Dip tube guide arrangement. 3,672,028, Cl. 29-208.00b.

Bomba, Georg A., 1/2 to Walker, Fred J. Exhaust feedback and control system for internal combustion engines. 3,672,340, Cl. 123-119.00a.

Bonnier, Etienne; Allibert, Colette; Driole, Jean; and Wicker, Alain, to Agence Nationale de Valorisation de la Recherche. Method of separation of a substance in a solid or liquid phase from a matrix in the liquid phase. 3,672,872, Cl. 75-63.000.

Booth, Dwight Allan, to Omark Air Controls, Inc., mesne. Holder for dental handpiece. 3,672,059, Cl. 32-22.000.

Booth, Robert C.: *See—*
Hoffman, John P.; and Booth, Robert C., 3,673,493.

Bor, Thomas P., to Allied Chemical Corporation. Method of preparing delustered filaments and fibers. 3,673,147, Cl. 260-37.00n.

Borden, Inc.: *See—*
Erekson, Arthur B., 3,673,019.

Borowski, Richard: *See—*
Neumann, Edward W.; and Borowski, Richard, 3,672,942.

Borrevang, Poul; and Faarup, Peter, to Novo Terapeutisk Laboratorium A/S. Steroid compounds of the estrane, androstane, pregnane and 19-norpregnane series and the preparation thereof. 3,673,224, Cl. 260-397.400.

Bosch, Robert, G.m.b.H.: *See—*
Biechl, Josef; and Konrath, Karl, 3,672,343.
Kammerer, Heinz, 3,673,564.
Kock, Klaus, 3,673,292.

Bosse, Frank, to Windmoller & Holscher. Carrying bag of plastics material sheeting. 3,672,562, Cl. 229-54.00c.

Boucher, Raymond Marcel Gut, to Wave Energy Systems, Inc. Method of sterilizing liquids. 3,672,823, Cl. 21-54.00r.

Bouligny, R. H., Inc.: *See—*
Pierce, John H., 3,672,587.

Bowden, Roy Dennis, to Imperial Chemical Industries, Limited. Manufacture of bipyridyls. 3,673,199, Cl. 260-296.00d.

Bowen, Elba W., to Metals Engineering Corporation. Quick release holder. 3,672,619, Cl. 248-113.000.

Brack, Alfred, to Farbenfabriken Bayer Aktiengesellschaft. Naphtholactam-(1,8) basic dyestuffs. 3,673,182, Cl. 260-242.000.

Braden, Rudolf: *See—*
Rinkler, Heinrich; Braden, Rudolf; and Nischk, Gunther, 3,673,242.

Bradley, John J.: *See—*
Small, Rudolph E.; Bradley, John J.; Sanders, Charles J.; and Slawny, Howard J., 3,673,052.

Brandt, Jack P., to Uniroyal, Inc. Dry cleanable vinyl type artificial leather. 3,673,059, Cl. 161-88.000.

Brandt, Siegfried: *See—*
Schmitt, Karl; Gude, Fritz; and Brandt, Siegfried, 3,673,273.
Schmitt, Karl; Guda, Fritz; and Brandt, Siegfried, 3,673,277.

Braun Aktiengesellschaft: *See—*
Muller, Karl, 3,673,342.

Braun, Werner: *See—*
Bauer, Rudolf; Jacob, Herbert; and Braun, Werner, 3,672,495.

Braverman, Maynard, mesne: *See—*
Fisher, William J., 3,672,015.

Brawn, John M., to United States of America, Navy. Temperature sensing squib firing device. 3,672,303, Cl. 102-70.20r.

Brechbuhler, Hans Ulrich; and Gubler, Kurt, to Ciba-Geigy Corporation. Basically substituted 1-cyano-O-carbamoyl-formoximes. 3,673,236, Cl. 260-465.400.

Bredzs, Nikolajs; and Miller, Forbes M., to Wall Colmonoy Corporation. Coating on metal base. 3,672,849, Cl. 29-195.000.

Breitschwerdt, Werner; Andres, Rudolf; and Busch, Gerhard, to Daimler-Benz Aktiengesellschaft. Installation for cleaning the cover panes of motor vehicle headlights. 3,671,994, Cl. 15-250.360.

Brennan, John F., to Universal Oil Products Company. Closure for high pressure chamber. 3,672,534, Cl. 220-46.00p.

Brennen, Ronald F. Spark plug. 3,673,452, Cl. 313-141.000.

Breslow, Leon. Article hanging apparatus. 3,672,622, Cl. 248-224.000.

Brevick, Arnold Aage, to Bunker-Ramo Corporation, The. Magnetic switches and method and apparatus for making same. 3,673,526, Cl. 335-205.000.

Brian, Robert Coles; and Bland, Peter Douglas, to Imperial Chemical Industries Limited. Plant treatment composition comprising a plant treatment chemical, a wetting agent and an aliphatic alcohol. 3,673,087, Cl. 252-1.000.

Bridel, Laiteries E.: *See—*
Barbier, Jean-Pierre; and Feugnet, Jean-Pierre, 3,672,056.

Bridenstine, Orville J.; Shutt, Melvin S.; and Brookshire, Harry A., to Phillips Petroleum Company. Tray collar and tray-collar combinations. 3,672,530, Cl. 220-4.00r.

Bridgestone Tire Company Limited: *See—*
Iwami, Ichiro; Honda, Toshio; and Fukuura, Yukio, 3,673,022.

Bright, Charles R. Glass lens edging apparatus. 3,672,855, Cl. 51-101.0lg.

Brill, Frank D.: *See—*
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Brion, Kenneth J.: *See—*
Cramp, Allen R.; and Brion, Kenneth J., 3,672,207.

British Aircraft Corporation Limited: *See—*
Walley, Gerald D., 3,672,606.

British Hovercraft Corporation Limited: *See—*
Riddle, Lavis Albert Henry; and Craig, Thomas, 3,672,461.

British Iron and Steel Research Association: *See—*
Widdowson, Roy; and Speceley, Gene Donald, 3,672,432.

British Iron and Steel Research Association, The: *See—*
Rhydderch, Malvern John, 3,672,870.

British Petroleum Company Limited, The: *See—*
Allum, Keith George; and Robinson, Peter John, 3,673,114.

Britton, Ralph H., Jr., to Hufnagel, Fred M. Pulse drive circuit for coils of dental impact tools and the like. 3,673,475, Cl. 318-122.000.

Broadway, Alexander Richard William; Fong, William; and Rawcliffe, Gordon Hindle, to National Research Development Corporation. Pole-changing, three-phase alternating current induction motor, with single-layer stator winding. 3,673,477, Cl. 318-224.00r.

Brock, John L., to Xerox Corporation. Reciprocating carriage for electrographic printing. 3,673,603, Cl. 346-139.000.

Brody, Charles; and Brody, Rhoda Sharon. Dog toilet. 3,672,331, Cl. 119-1.000.

Brody, Rhoda Sharon: *See—*
Brody, Charles; and Brody, Rhoda Sharon, 3,672,331.

Bronstein, Harry. Steering indicator. 3,673,561, Cl. 340-52.00r.

Bronstert, Klaus; Ladenberger, Volker; and Fahrbach, Gerhard, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Catalytic hydrogenation of polymers containing double bonds. 3,673,281, Cl. 260-880.00b.

Brookdeal Electronics Limited: *See—*
Faulkner, Eric Andrew, 3,673,506.

Brooker, Leslie G. S.; and Fumia, Arthur, Jr., to Eastman Kodak Company. Silver halide emulsions sensitized with methine dyes containing a cyclopentanone nucleus. 3,672,906, Cl. 96-142.000.

Brooks, Robert E., to TRW Inc. Holographic real-time interferometry with a reconstructed reference beam. 3,672,776, Cl. 356-106.000.

Brookshire, Harry A.: *See—*
Bridenstine, Orville J.; Shutt, Melvin S.; and Brookshire, Harry A., 3,672,530.

Brouilliard, Robert E.; Coughlin, Leonard J.; and Winfrey, Vernon L., to Penick & Fred Limited. Benzyl starch emulsion coating compositions. 3,672,922, Cl. 106-211.000.

Brown, Alexander M., to Sherwood Medical Industries, Inc. Hypodermic syringe. 3,672,369, Cl. 128-218.00p.

Brown, Howard W.: *See—*
Clark, Thomas J.; and Brown, Howard W., 3,673,051.

Brown, Kenneth M., to Universal Oil Products Company. Treatment of an aqueous stream containing water-soluble inorganic sulfide compounds. 3,672,836, Cl. 23-224.000.

Brown, Mortimer, to Ram Partitions Limited. Movable partition wall. 3,672,424, Cl. 160-40.000.

Brown, Robinson W.: *See—*
Gerlach, Charles R.; and Brown, Robinson W., 3,672,797.

Brown, Stirling Robert: *See—*
Murhpy, James A.; and Brown, Stirling Robert, 3,672,950.
Murphy, James A.; and Brown, Stirling Robert, 3,673,060.

Brown, Stirling Robert, to International Paper Company, mesne. Adhesively laminated creped tissue product. 3,672,949, Cl. 161-129.000.

Brown, Stirling Robert; and Lee, Charles A., to International Paper Company, mesne. Adhesively laminated kraft paper product. 3,672,952, Cl. 161-146.000.

Brown, Stirling Robert, to International Paper Company, mesne. Method for the manufacture of laminated fabrics. 3,673,026, Cl. 156-164.000.

Brown, Thomas L.: *See—*
Paramore, Edwin L.; O'Loughlin, Bernard T.; and Brown, Thomas L., 3,672,173.

Brown, William A.; and Drenning, John F., to Miller and Company. Metallurgical material and processes for treating steel therewith. 3,672,871, Cl. 75-58.000.

Brown, William E.; Heitz, Robert G.; and Levine, Charles A., to Dow Chemical Company, The. Solid electrolyte for electrical cells. 3,672,995, Cl. 136-6.000.

Broyer, Robert, to Regie Nationale des Usines Renault. Automobile bodies. 3,672,718, Cl. 296-1.00s.

Brubaker, Burton D.; and Waldman, Nathan, to Dow Chemical Company, The. Foamed clay process. 3,673,290, Cl. 264-43.000.

Brumbaugh, Philip A.; Harrington, Richard H.; Nemier, Stanley E.; and Nielsen, Thomas C., to International Business Machines Corporation. Wire matrix print head. 3,672,482, Cl. 197-1.00r.

Brungs, Charles A.: *See—*
Sabatelli, Philip M.; and Brungs, Charles A., 3,673,098.

Bryan, Leslie Oliver: *See—*
Howe, John Arthur; and Bryan, Leslie Oliver, 3,673,368.

Bryant, Ellis H., Jr.: *See—*
Smith, Leary W.; and Bryant, Ellis H., Jr., 3,673,344.

Bryson, Neil Burton, to Alcan Research and Development Limited. Apparatus and procedures for continuous casting of metal ingots. 3,672,431, Cl. 164-82.000.

Buchanan, Russell A.; and Russell, Charles R., to United States of America, Agriculture. Powdered polysaccharide-reinforced elastomer masterbatches, compounds, and resulting vulcanized rubbers. 3,673,136, Cl. 260-17.4bb.

Buchheit, Otto Karl, to Moeller & Neumann GmbH. Exit rollway for rolled bars or rods in particular flat or profiled bars, with transverse conveyance device. 3,672,489, Cl. 198-219.000.

Buchmann, Paul; and Beringer, Monique, to Solco Basel AG. Dialysis apparatus. 3,672,509, Cl. 210-321.000.

Buchzik, Charles M., to FMC Corporation. Method of improving quality and storage stability of dehydrated products. 3,672,917, Cl. 99-199.000.

Buck, Ronald H., Jr.; and Zbikowski, Ted, to Eaton Corporation. Mold pattern. 3,672,435, Cl. 164-247.000.

Buckley, Alan; and Thomas, Ieuan, to Imperial Chemical Industries Limited. Copolyamides from bis(aminophenyl)sulfone. 3,673,162, Cl. 260-78.00r.

Buehler, William J. TiNi cast product. 3,672,879, Cl. 75-170.000.

Buell, Eugene F. Anti-theft devices for motorcycles, bicycles and the like. 3,673,562, Cl. 340-63.

Buell Industries, Incorporated: *See—*
Becker, Phillip D., 3,672,532.

Bugur, Victor: *See—*
Georgescu, Eugenia; Gheja, Ion; Bugur, Victor; Zirna, Ion; Mazare, Theodora; Popescu, Elena-Lygia; Olteanu, Bujor; Marculescu, Nicolae; Filotti, Traian-Mircea; Barbul, Marius-Aurel; and Calin, Ion, 3,673,109.

Buisson, Francois; and Gresteau, Jean Paul, to Societe Rhodiaceta. Process for producing brilliant sulfonated polyamide-imide fibers and such fibers so produced. 3,673,160, Cl. 260-78.0tf.

Bukama GmbH: *See—*
Korth, Jurgen, 3,672,555.

Bulgin, Reginald W. Plug socket for use in a distributor system for electrical power. 3,673,361, Cl. 200-51.030.

Bull General Electric Nederland N.V.: *See—*
Keulen, Gerben Jan, 3,672,668.

Bullock, Milon Walker; and Hand, John James, to American Cyanamid Company Racemization of d(+) 6-phenyl-2,3,5,6-tetrahydroimidazo[2,1-b] thiazole. 3,673,206, Cl. 260-306.700.

Bulova Watch Company, Inc.: *See—*
Mutter, William W., 3,672,153.

Bundschuh, John J., to Eastman Kodak Company. Film feeding mechanism with movable cartridge mounting means. 3,672,601, Cl. 242-192.000.

Bunker-Ramo Corporation, The: *See—*
Brevick, Arnold Aage, 3,673,526.
Healy, Robert M.; and Marshall, Robert, 3,673,539.
Reefman, William E., 3,672,152.
Rundle, David F., 3,673,545.

Burchell, Geoffrey Barnett; and Morel, Richard William Victor. Valve and circuit for intermittent positive pressure breathing apparatus. 3,672,366, Cl. 128-145.8.

Burckhalter, James A. Lifting device. 3,672,716, Cl. 294-50.600.

Burckhardt, Manfred H.; Florus, Hans-Jorg; Grossner, Horst; and Krohn, Helmut, to Daimler-Benz Aktiengesellschaft. Brake force controls system for vehicles, especially motor vehicles. 3,672,730, Cl. 303-21.0be.

Burger, Walter: *See—*
Levacher, Friedrich; Ditscheid, Hans Leo; Burger, Walter; Asselborn, Peter; and Cramer, Werner, 3,672,196.

Burgess, George A.: *See—*
Denight, James P.; and Burgess, George A., 3,672,581.

Burk, George A., to Dow Chemical Company, The. Esters of N-halocyanoacetyl carbamic acids. 3,673,235, Cl. 260-465.400.

Burke, Oliver W., Jr.; Kizer, Joseph Austin A.; and David, Pauls. Polymerization process. 3,673,168, Cl. 260-94.20r.

Burklund, Glenn A. Apparatus for texturizing yarns and the like. 3,672,012, Cl. 28-1.200.

Burman, Per Aron; and Drew, Harold E., to Burroughs Corporation. Integrated circuit extractor tool. 3,673,384, Cl. 219-230.000.

Burns, Edgar, to Mattel, Inc. Movable boundary board game apparatus. 3,672,679, Cl. 273-131.0ba.

Burroughs Corporation: *See—*
Burman, Per Aron; and Drew, Harold E., 3,673,384.
Eisenberg, Mark F., 3,673,461.
Lund, George E., 3,673,438.
Tackett, Raymond W., 3,673,451.

Burtin, James D., to Detroit Tool and Engineering Company. Pneumatic cement gun machine. 3,672,646, Cl. 259-151.000.

Burton Electrochemical Co., Inc.: *See—*
Baldwin, Philip C., 3,672,968.

Burton, Paul T.; Cole, Walter E.; Frassetto, Henry E., Jr.; Gibson, Robert G.; Greenberg, Allan; Handloff, Louis E.; and Radlinsky, Raymond, to International Business Machines Corporation. Microprogrammed common control unit with double format control words. 3,673,575, Cl. 340-172.500.

Burzenski, Ralph A. Wheeled foot-exercising device with hand grips. 3,672,670, Cl. 272-79.00r.

Busch, Gerhard: *See—*
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Bush Boake Allen Limited: *See—*
Janes, John Francis; Jaggers, Brian George; and Curtis, Anthony John, 3,673,120.

Bussey, Marlin G.: *See—*
Moore, Eugene R.; Bussey, Marlin G.; and Parish, Hal G., 3,672,951.

Buth, Roy C.; and Schroeder, Arthur F., to United States of America, Navy. Flechette assembly machine. 3,673,047, Cl. 156-563.000.

Butriss, Albert T., to Eaton Yale & Towne, Inc. Fastener driving apparatus. 3,672,029, Cl. 29-243.560.

Buttriss, Albert T., to Eaton Corporation. Cartridge device for fasteners and the like. 3,672,738, Cl. 312-71.000.

Butzler, George J.: *See—*
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Byrne, Joseph E. Circular sawing tool. 3,672,785, Cl. 408-206.000.

Cairns, Hugh; and Johnson, Peter Bennett, to Fisons Pharmaceuticals Limited. Bichromonyl compounds. 3,673,218, Cl. 260-345.200.

Calbeck, J. R.: *See—*
Calbeck, John H., 3,672,830.

Calbeck, John H., to Calbeck, J. R. Zinc sulfide pigment and method of making same. 3,672,830, Cl. 23-135.000.

Caldwell, Gary Lee; Eger, Thomas Richard; and Miller, Frederick Warren, to Du Pont de Nemours, E. I., and Company. Spinning quench chamber having a conical flow director. 3,672,801, Cl. 425-71.000.

California Computer Products, Inc.: *See—*
Torres, Mario A., 3,672,599.

Calin, Ion: *See—*
Georgescu, Eugenia; Gheja, Ion; Bugur, Victor; Zirna, Ion; Mazare, Theodora; Popescu, Elena-Lygia; Olteanu, Bujor; Marculescu, Nicolae; Filotti, Traian-Mircea; Barbul, Marius-Aurel; and Calin, Ion, 3,673,109.

Callahan, Michael J., Jr., to Texas Instruments, Incorporated. Solid state operational amplifier. 3,673,508, Cl. 330-30.00d.

Callieri, Michele; Faraci, Giorgio; and Paracchini, Mario, to Bemberg S.p.A. Method for manufacturing yarn consisting of fibres and filaments. 3,672,147, Cl. 57-157.00f.

Camacho, Salvador L., to Technology Application Services Corporation. Long arc column plasma generator and method. 3,673,375, Cl. 219-121.00p.

Camco, Incorporated: *See—*
Watkins, Fred E.; and Tausch, Gilbert H., 3,672,397.

Campbell, David: *See—*
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Campbell, John A.: *See—*
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Campbell, Robert W.: *See—*
Hill, Harold Wayne, Jr.; and Campbell, Robert W., 3,673,247.

Canon Camera Kabushiki Kaisha: *See—*
Inoue, Eiichi; Yamaji, Keizo; Tanaka, Hiroshi; and Saito, Takashi, 3,673,595.

Canonico, Domenic A.; Cole, Nancy C.; and Houck, Clarence W., to United States of America, Atomic Energy Commission. Method for brazing graphite and other. 3,673,038, Cl. 29-195.000.

Cantor, Paul A.: *See—*
King, William M.; and Cantor, Paul A., 3,673,084.

Carborundum Company, The: *See—*
Ehrenreich, Leo C., 3,672,936.

Cardiac Electronics, Inc.: *See—*
Crovella, Edward A.; and Barfield, C. Verne, 3,672,353.

Carlen, Jan-Christer Henric Ovesson; and Bergqvist, Claes Bertil, to Sandviken Jernverks Aktiebolag. Corrosion-resistant razor blades. 3,672,877, Cl. 75-126.00c.

Carlson, Chesley F., Company: *See—*
Pamlenyi, George, 3,672,767.

Carlson, Gordon S.: *See—*
Crowley, George C.; and Carlson, Gordon S., 3,673,381.

Carlson, Robert A.; and Foley, Thomas P. Reel-to-reel tape storage apparatus. 3,672,600, Cl. 242-186.000.

Carlson, Robert J.; and Reymann, Royal A., Jr., to United States of America, Army. Electric impact switch. 3,673,362, Cl. 200-61.45r.

Carmet Company: *See—*
Sowko, John J., Sr., 3,672,881.

Carmody, William D.; Thompson, Charles J.; and Butzler, George J., to Dow Chemical Company, The. Continuous process for making expandable thermoplastic resin compositions. 3,673,126, Cl. 260-2.50e.

Carnt, Peter Swift; and Schiess, George, to RCA Corporation. Television apparatus responsive to a transmitted color reference signal. 3,673,320, Cl. 178-5.4he.

Carpenter, Thomas J., to General Electric Company. Two-wire preionizer for surge voltage arresters. 3,673,459, Cl. 315-36.000.

Carr, Alton F. Waste basket and the like. 3,671,995, Cl. 15-257.100.

Carr, Kenneth L., to Ferrotec, Inc. Stub tuned circulator. 3,673,518, Cl. 333-1.100.

Carrier Corporation: *See—*
Mount, Gordon L., 3,672,786.

Carroll, Robert L.: *See—*
Chappell, Robert N.; and Carroll, Robert L., 3,672,170.

Carson, Forrest L., to Huber, J. M., Corporation. Quick opening closure cap. 3,672,715, Cl. 292-257.000.

Carson, Theo L. Underground service module. 3,672,445, Cl. 165-42.000.

Carter, Kenneth G. Wire feeder. 3,672,655, Cl. 226-108.000.

Carter, Sidney T., to A-T-O Inc. Apparatus for adhesively applying sealing strips to container closures to prevent unauthorized removal of the closures without detection. 3,673,043, Cl. 156-363.000.

Cartridge Television, Inc., mesne: *See—*
Berg, Peter; and Linder, Bertil C., 3,673,349.
Larkin, Thomas J., 3,673,348.

Casella, Luigi; Perna, Aldo; and Valbonesi, Giuseppe, to Societa Italiana Telecommunicazioni Siemens S.p.A. Data-evaluation system for telephone exchange. 3,673,340, Cl. 179-18.00j.

Cashman, Harland J., Jr., to United States of America, Army. Combination emitter follower digital line driver/sensor. 3,673,570, Cl. 340-147.000.
Caspar Honegger: *See—*
Strauss, Edgar H., 3,672,404.
Caspary, Rudolf; and Kretschmer, Peter, to Dunlop Holdings Limited. Device for the measurement of the angle of rotation of a rotatable object. 3,672,212, Cl. 73-99.000.
Cazabon, Dennis C.; and Dunbar, John R., to Ford Motor Company. Position locator for an adjustable seat supporting assembly. 3,672,625, Cl. 248-429.000.
Celanese Corporation: *See—*
Lipe, Jerome G., 3,673,036.
Reader, Arthur M.; and Stackman, Robert W., 3,673,158.
Celio, Tino: *See—*
Schaub, Heiner; Thaddey, Kurt; and Celio, Tino, 3,672,768.
Cevidalli, Guidobaldo; Ragazzini, Mario; and Modena, Mario, to Montecatini Edison S.p.A. Copolymers of carbon monoxide with carbonyl compounds and process for their preparation. 3,673,156, Cl. 260-67.0rp.
Chaffin, Chester C., to Ezy-Way Manufacturing & Sales Co. Lifting apparatus. 3,672,634, Cl. 254-2.00c.
Chan, Teng: *See—*
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Chandler Evans Inc.: *See—*
White, Albert H., 3,672,163.
Chaney, Richard M.: *See—*
Cornish, Rodney H.; Staulcup, James T.; and Chaney, Richard M., 3,672,426.
Chang, Elizabeth Puiiu, to Eastman Kodak Company. Direct-positive silver halide emulsions containing gold salt complex addenda. 3,672,903, Cl. 96-108.000.
Chang, Lin-Huey; and: *See—*
Liu, Jui-Chang; and Chan, Teng, 3,672,491.
Chappell, Robert N.; and Carroll, Robert L., to Lockheed Aircraft Corporation. Propellant grain suspension system. 3,672,170, Cl. 60-255.000.
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Chase-Shawmut Company, The: *See—*
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Chemagro Corporation: *See—*
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Chemed Corporation: *See—*
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Chemetron Corporation: *See—*
Vander Ploeg, John Herman; and Weener, Earl, 3,673,192.
Chen, Nai Yuen; and Smith, Fritz A., to Mobil Oil Corporation. Isomerization of cyclohexane in the presence of a mordenite catalyst. 3,673,267, Cl. 260-666.00p.
Cherel, Guy H., to Saint-Gobain Techniques Nouvelles. Apparatus and method for processing spent nuclear fuel elements. 3,672,247, Cl. 83-35.
Chevron Research Company: *See—*
Mulaskey, Bernard F.; and Chilton, Elmore F., 3,673,079.
Woo, Gar Lok, 3,673,122.
Chilcoat, Kermit E., to Eaton Corporation. Mounting means. 3,672,706, Cl. 285-189.000.
Childers, Billie W.: *See—*
Luscher, Paul,; Hudson, Ben A.; and Childers, Billie W., 3,672,947.
Childs, Edwin E., Jr., to Dolomite Brick Corporation of America. Microwave method for tempering tar-bonded refractory bricks. 3,673,288, Cl. 264-25.000.
Chilton, Elmore F.: *See—*
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CHINOIN Gyogyszer-es Vegyeszeti Termekek Gyara R.T.: *See—*
Harsanyi, Kalman; Takacs, Kalman; Relle, Zsuzsa, nee Somfai; Milak, Eva, nee Krompecher; Tardos, Laszlo; Korbonits, Dezso; Kiss, Pal; and Gonczy, Csaba, 3,673,188.
Chorey, Andro J. Car top carrier and access ladder. 3,672,549, Cl. 224-42.10e.
Chow, Peter C. M., to Grove Valve and Regulator Co. Swing out valve structure. 3,672,632, Cl. 251-151.000.
Chris-Craft Industries, Inc.: *See—*
Rosin, Jacob; and Ang, Frank S., 3,673,259.
Christianson, Roger D., to Titeflex, a Division of Atlas Corporation. Lip-seal fitting. 3,672,704, Cl. 285-110.
Ciba Corporation: *See—*
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Toepel, Rosemarie; Abel, Heinz; Maeder, Arthur; and Leifels, Klaus-Dieter, 3,673,558.
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Bandyopadhyay, Pratip, 3,672,450.
Citizen Watch Company Limited: *See—*
Yasuda, Tetuya; Tutiya, Hidetaka; and Mori, Takeshi, 3,672,150.
City of Fort Collins: *See—*
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Clark, James E., to Bell Telephone Laboratories, Incorporated. Method for bonding a beam-lead device to a substrate. 3,672,034, Cl. 29-471.100.
Clark, Terry D. Combined drink bar and room divider console. 3,672,741, Cl. 312-223.000.
Clark, Thomas J.; and Brown, Howard W., to General Electric Company. Pyrolytic graphite. 3,673,051, Cl. 161-166.000.
Classen, Franz, to Erste Deutsche Floatglas GmbH & Co. OHG. Method for the production of a float glass strip having a roughened upper surface. 3,672,859, Cl. 65-93.
Clauson-Kaas, Niels: *See—*
Denss, Rolf; Clauson-Kaas, Niels; and Ostermayer, Franz, 3,673,212.
Clements, Henry George, to United Kingdom Atomic Energy Authority. Fire extinguishing powders comprising a cellulose ether additive. 3,673,088, Cl. 252-2.000.
Cloutier, Emeric. Endless fishing cable installation. 3,672,091, Cl. 43-27.400.
Clover, Richmond Bennett, Jr., to RCA Corporation. Bubble domain sonic propagation device. 3,673,582, Cl. 340-174.0ms.
Cofer, Daniel B., to Southwire Company. Method of producing a hot-formed copper-base product. 3,672,430, Cl. 164-76.000.
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Cole, Frank J.: *See—*
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Cole, Walter E.: *See—*
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Coleman, Donald James, Jr.; and Sze, Simon Min, to Bell Telephone Laboratories, Incorporated. Schottky barrier transit time negative resistance diode circuits. 3,673,514, Cl. 331-107.00r.
Coles, Kyle R. Shoe construction and method. 3,672,077, Cl. 36-2.50t.
Colgate-Palmolive Company: *See—*
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Collingwood, George Howard: *See—*
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Collins, Bernard, to Collins, Bernard, Limited. Conveyors. 3,672,488, Cl. 198-189.000.
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Collins, David Janett,: *See—*
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Collins, James D.; and Wilsdon, Thomas A., to Westinghouse Electric Corporation. Contactor. 3,673,525, Cl. 335-132.000.
Colliver, David John; and Hilsum, Cyril, to United Kingdom of Great Britain and Northern Ireland, Minister of Technology in Her Britannic Majesty's, Government of the. Transferred electron devices. 3,673,469, Cl. 317-234.00r.
Columbia Broadcasting System, Inc.: *See—*
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Columbia Gas System Service Corporation: *See—*
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Connollys (Blackley) Limited: *See—*
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Conrad, Martin B. Support assembly for camper. 3,672,524, Cl. 214-515.000.
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Constable, Geoffrey Ernest Patrick, to Smiths Industries Limited. Credit-and access-control equipment. 3,673,571, Cl. 340-149.00a.
Container Corporation of America: *See—*
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Continental Can Company, Inc.: *See—*
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Conway, Donald J., to United States Gypsum Company. Joint construction. 3,672,108, Cl. 52-367.000.
Conwell, Phillip J. Steam powered vehicle. 3,672,048, Cl. 180-67.000.
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Cooley, Kenton Parkes; and Jago, Edward John, to Foseco International Limited. Method of lining contoured moulds and head boxes with deformable lining element. 3,672,427, Cl. 164-6.000.
Coon, Clifford L., to Stanford Research Institute. Polychloro amidines and process for preparing them. 3,673,252, Cl. 260-564.00r.
Cooper, Robert B., Jr., 1/2 to Sossen, Edwin J. Interdigital preamplifier. 3,673,509, Cl. 330-31.000.
Coors, Adolph, Company: *See—*
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Corbach, Klaus, to Fischer, Georg, AG. Numerical positional control. 3,672,834, Cl. 235-151.110.
Corby, William Joseph; Garbarini, Victor Charles; and White, Malcolm Lunt, to Bell Telephone Laboratories, Incorporated. Process and composition for stripping cured resins from substrates. 3,673,099, Cl. 252-156.000.
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Corning Glass Works: *See—*
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Cornish, Rodney H.; Staulcup, James T.; and Chaney, Richard M., to Belden Corporation. Process of casting filament. 3,672,426, Cl. 164-5.000.
Corvi, Joseph A.; and Lawrence, William G., to Corvonics Corporation. Device to detect motion. 3,673,590, Cl. 340-258.00a.
Corvonics Corporation: *See—*
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Coty, Vernon F.; Heilweil, Israel J.; and Leavitt, Richard I., to Mobil Oil Corporation. Process for growing cells of a microorganism on a carbon-containing liquid substrate. 3,672,953, Cl. 195-28.000.
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Crane, Grant: *See—*
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Crawford, William R.: *See—*
Dubreuil, Philip B.; Bartok, Stephen; and Crawford, William R., 3,672,408.
Creffield, David F., to USM Corporation. Cutting press having improved means for handling cut product. 3,672,250, Cl. 83-92.000.
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Singh, Kanwal N.; Cremean, Stephen P.; and Scott, Donald R., 3,672,442.
Cressman, Russell N.; Bantz, Walter J.; and Nusbickel, Edward M., Jr., to Bethlehem Steel Corporation. Ultrasonic inspection system with scanned multiple transducers. 3,672,210, Cl. 73-67.900.
Crixell, Arthur R., to Monsanto Company. Rotor for intensive mixers. 3,672,644, Cl. 259-104.000.
Crosby: *See—*
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Crose, Harvey L. Mixer. 3,672,640, Cl. 259-6.000.
Crosslen, Louis John, to Mayer, Frank, & Associates, Inc. Tape cartridge dispenser. 3,672,480, Cl. 194-92.000.
Crovella, Edward A.; and Barfield, C. Verne, to Cardiac Electronics, Inc. Ectopic heartbeat detector. 3,672,353, Cl. 128-2.06a.
Crowley, George C., to Northern Electric Company. Glow switch relay for blanket overheat control system. 3,673,380, Cl. 219-212.000.
Crowley, George C.; and Carlson, Gordon S., to Northern Electric Company. Thermostatles blanket control circuit. 3,673,381, Cl. 219-212.000.
Cruickshank, David G.; and Guerin, David T., to Leesona Corporation. Bobbin segregating and orienting apparatus. 3,672,542, Cl. 221-161.000.
Cryodry Corporation: *See—*
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Csizi, Gotthard: *See—*
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Curtis, Anthony John: *See—*
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Curtis, James H.; and Woodward, Fred E., to Diamond Shamrock Corporation. Defoamer compositions for aqueous systems. 3,673,105, Cl. 252-321.000.
Cutler, Arthur S.; and Smith, Dallas F., to General Electric Company. Apparatus for developing wound coils for electromagnetic devices. 3,672,026, Cl. 29-205.00r.
Cyba, Henryk A., to Universal Oil Products Company. N-Hydroxy alkyl-N' cycloalkyl piperazines. 3,673,186, Cl. 260-268.00r.
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Dalik, Herbert A., to Flintkote Company, The. Pipe belling machine. 3,672,804, Cl. 425-328.000.
Dalmasso, Claudio, to Olivetti, Ing. C., & C., S.p.A. Integrated semiconductor circuit package and method. 3,673,309, Cl. 174-52.0pe.
Damiano, John Joseph, to Amchem Products, Inc. Use of n-sec-butyl-4-t-butyl-2,6- dinitroaniline as a selective herbicide. 3,672,866, Cl. 71-121.000.
Damouth, David E., to Xerox Corporation. Electrographic recording method and apparatus. 3,673,600, Cl. 346-74.0es.
Dardoufas, Kimon Constantine, to Allied Chemical Corporation. Production of polyesters. 3,672,977, Cl. 117-138.80f.
Darland, William G., Jr., to Union Carbide Corporation. Extended area zinc anode having low density for use in a high rate alkaline galvanic cell. 3,672,998, Cl. 136-30.000.
Darling, Alan Sydney; and Selman, Gordon Leslie, to Johnson, Matthew & Co., Limited. Platinum-thodium-gold alloys. 3,672,880, Cl. 75-172.000.
D'Augustine, Frank Thomas, to RCA Corporation. Process for screening cathode ray tubes including salvaging of excess phosphor slurry. 3,672,932, Cl. 117-33.50c.
Daum, Werner; Scheinpflug, Hans; Frohberger, Paul-Ernst; and Grewe, Ferdinand, to Farbenfabriken Bayer Aktiengesellschaft. N-(ω-Cyano-alkyl)-carbamyl-benzimidazoles. 3,673,210, Cl. 260-309.000.
Daussan, Henri Jean. Process of casting an ingot and stripping mold very shortly thereafter. 3,672,433, Cl. 164-123.000.

Davey, Anthony Walter, to Morris, Herbert, Limited. Automatically operating and controlling reciprocating motion. 3,673,482, Cl. 318-266.

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Davis, Elbert. Structure for connecting attachments to fiberglass rods. 3,672,712, Cl. 287-20.20r.

Davis, James G. Dispensing holder for paper rolls and the like. 3,672,591, Cl. 242-55.200.

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De Jaeger, Norbert Maurice. Process for the manufacture of particle boards utilizing a dry organic binder. 3,673,020, Cl. 156-62.200.

De Jongh, Hendrik Paul, to Organon Inc. 7-Alkyl-steroids. 3,673,225, Cl. 260-397.00.

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De Mauriac, Richard A., to Eastman Kodak Company. Photothermographic elements containing bis-beta-naphthols. 3,672,904, Cl. 96-114.100.

De Nora, Vittorio; and Loftfield, Richard E., to Oronzio de Nora Impianti Elettrochimici S.p.A. Cell cover with weakened areas to relieve explosions. 3,672,973, Cl. 204-99.000.

De Palma, Vito A., to Cornell Aeronautical Laboratory, Inc. Process of coating metals with mercury or mercury amalgams. 3,672,963, Cl. 204-14.00n.

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De Windt, Edward Mandell, to Eaton Corporation. Automatic restraint system arming control. 3,672,699, Cl. 280-150.0ab.

De Witt, David; Dhaka, Vir A.; and Oberai, Avtar S., to International Business Machines Corporation. Process for making metal contacts to high speed transistors and product formed thereby. 3,672,983, Cl. 117-212.000.

Dean, John W., to General Electric Company. Block copolymers of silicones with vinyl pyridine. 3,673,272, Cl. 260-827.000.

Deck, Lester T.; and Kupsky, Fredrick E., 1/2 to United States Gypsum Company and 1/2 to Stanray Corporation, mesne. Reticulated bar grating. 3,672,111, Cl. 52-666.000.

Decursu, Giorgio; De Pas, Jonathan; D'Urbino, Donato; and Lomazzi, Paolo. Modular unit element for furniture. 3,672,723, Cl. 297-440.000.

Degen, Joseph F.: *See—*
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Degnon, Julia S. Headdress with improved head encircling band. 3,671,977, Cl. 2-207.000.

Dehne, Clarence A.; and Folsom, Harold A., to Webb, Jervis B., Company. Conveyor carrier with pivotal motion damping load suspension. 3,672,306, Cl. 104-89.000.

Dehnert, Johannes, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Process for dyeing synthetic polyamide textiles with disazo dyestuffs. 3,672,816, Cl. 8-41.00b.

DeJong, Egbert D.; Koch, Hans; and Maynard, Kenneth B., to International Business Machines Corporation. Card packaging apparatus. 3,672,118, Cl. 53-59.00r.

Delaney, William E., to Kadison Laboratories, Inc. Condiment containing sodium diacetate. 3,672,914, Cl. 99-140.00r.

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Delfs, Larry M., to Valmont Industries, Inc. Rough ground self-propelled sprinkling irrigation apparatus. 3,672,572, Cl. 239-212.000.

Deltoro, Thomas M. Automated color print processor. 3,672,288, Cl. 95-89.00r.

Demci, Michael; and Ihasz, Richard, to Sperry Rand Corporation. Hair trimmer attachment for electric shavers. 3,672,049, Cl. 30-90.000.

Demler, Henry William, Sr.: *See—*
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Denis, Andre. Gas water heater. 3,672,350, Cl. 126-350.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
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Derringer, Ray, to Preway Inc. Mobile home air conditioning unit. 3,672,349, Cl. 126-110.0aa.

Deryck, Petrus R., to ACEC Ateliers de Constructions Electriques de Charleroi. Support for a last used in a device for molding shoe soles. 3,671,989, Cl. 12-123.000.

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Di Stefano, Edmund J.; and Enderley, Arthur E., to International Business Machines Corporation. Connector assembly with tine skewing housing. 3,673,542, Cl. 339-14.00r.

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Diepeveen, John C. Adjustable mount. 3,672,651, Cl. 266-23.00f.

Dietz, Raymond Louis, to Owens-Illinois, Inc. Multilayer dielectric compositions comprising lead-barium borosilicate glass and ceramic powder. 3,673,092, Cl. 252-520.

Dijkhuizen, Willem; Termin, Erich; Bleh, Otto; and Morgenstern, Dieter, to Dynamit Nobel Aktiengesellschaft. Manufacture of polyurethanes using organic zirconium compounds as catalysts. 3,673,159, Cl. 260-77.5ab.

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Doi, Toshio: *See—*
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Donoghue, William J., to United States of America, Air Force, mesne. COS/MOS phase compartor for monolithic integration. 3,673,430, Cl. 307-232.000.

Dontas, Vassilios K. Spring retractable car key. 3,672,192, Cl. 70-414.000.

Doring, Erich. Apparatus to produce a riveted connection. 3,672,553, Cl. 227-62.000.

Dorsey, Geoffrey A., Jr., to Kaiser Aluminum & Chemical Corporation. Method for forming anodic oxide coatings having improved adhesive properties. 3,672,972, Cl. 204-58.000.

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Duecker, Heyman C.; and Glemza, Rimantas. Process for the preparation of fine-sized aluminas. 3,672,831, Cl. 23-143.000.

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Gona, Donald J.; and Oster, Richard J., 3,672,293.
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Eckerlin, Herbert M., to Corning Glass Works. Fluid flow restrictor having a variable coefficient of restriction. 3,672,401, Cl. 138-43.000.

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Edstrom, Nils Herbert; and Hemdal, Goran Anders Henrik, to Telefonaktiebolaget L M Ericsson. Process control scanner apparatus. 3,673,577, Cl. 340-172.500.

Educational Service Programs, Inc.: *See—*
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Edwards, James N.: *See—*
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EG&G, Inc.: *See—*
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Eger, Thomas Richard: *See—*
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Ehrenreich, Leo C., to Carborundum Company, The. Reinforced carbon and graphite articles. 3,672,936, Cl. 117-46.

Eibofner, Eugen; Fink, Willi; and Farian, Gerhard, to Kaltenbach & Voigt. Dental instrument. 3,672,060, Cl. 32-26.000.

Eichin, Harry P., to Union Carbide Corporation. Combination shipping container and dispenser for plastic film. 3,672,494, Cl. 206-57.00r.

Eikelenboom, Matthijs Johan. Training apparatus. 3,672,075, Cl. 35-29.00r.

Eisenberg, Mark F., to Burroughs Corporation. Circuit for driving the cathodes of a display device. 3,673,461, Cl. 315-169.0tv.

Eisenreich, William, to Eaton Corporation. Resistively-coded security system. 3,673,467, Cl. 317-134.000.

Ekbergh, Evert Oskar; and Jonsson, Per Gustaf. Bi-directional translator circuit. 3,673,338, Cl. 179-18.0et.

Eknayan, Hrant. Apparatus and method for treating engine exhaust products to minimize harmful constituents. 3,672,171, Cl. 60-274.000.

El Paso Products Company: *See—*
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Elektroschmelzwerk Kempten G.m.b.H.: *See—*
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Elizer, Lee H., to Hubinger Company, The. Starches containing non-ionic, basic and acidic groups and preparation and uses thereof. 3,673,171, Cl. 260-233.30r.

Elkins, Johnny C.; and Theriot, Gilbert A. Indexing means for wall panel openings. 3,672,064, Cl. 33-180.00r.

Ellinger, John Henry, to Rolls-Royce Limited. Variable pitch aerofoil blades. 3,672,788, Cl. 416-43.000.

Ellis Corporation: *See—*
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Ellis, Leonard C.: *See—*
Kise, Mearl A.; and Ellis, Leonard C., 3,672,829.

Ellis, Linus M., to Du Pont de Nemours, E. I., and Company. Increasing the sugar content of crops with α-ureidooxycarboxylic acids and their derivatives. 3,672,865, Cl. 71-106.000.

Elpern, Bill; Shapiro, Harris J.; Shroff, James R.; and Soloway, Harold, to USV Pharmaceutical Corporation. 2-Naphthoic acid derivatives. 3,673,238, Cl. 260-471.00a.

Eltra Corporation: *See—*
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Emerson Electric Co.: *See—*
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Envirotech Corporation: *See—*
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Erck, Karl, to Volkswagenwerk Aktiengesellschaft. Packing and securing strip for windshields. 3,672,109, Cl. 52-400.000.

Erdmann-Jesnitzer, Friedrich; and Rehfeldt, Dietrich, to Redemat S.A. Apparatus and method for controlling or monitoring electric welding processes. 3,673,377, Cl. 219-131.00r.

Erekson, Arthur B., to Borden, Inc. Apparatus for making absorbent pads. 3,673,019, Cl. 156-66.000.

Erickson, Leland E.: *See—*
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Erickson, Raymond Curry, to Squibb, E. R., & Sons, Inc. α-Ureidocephalosporanic acid compounds. 3,673,183, Cl. 260-243.00c.

Eriksson, Erik Birger, to Nordiska Maskinfilt Aktiebolaget. Method for the manufacture of endless drive belts and conveyor bands. 3,673,024, Cl. 156-137.000.

Erlichman, Irving, to Polaroid Corporation. Film container. 3,672,276, Cl. 95-19.000.

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Erwin, Curtis L., Jr. Fuel system for diesel engines. 3,672,394, Cl. 137-338.000.

Eschard, Gilbert, to U.S. Philips Corporation. Channel amplifying device comprising a plurality of coupled channel plates. 3,673,449, Cl. 313-105.000.

Esclamadon, Christian, to Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine. Halogenated thioethers and method of preparations. 3,673,260, Cl. 260-609.

Esposito, James Edward, to Amchem Products, Inc. Dry aminotriazole herbicidal formulation. 3,672,863, Cl. 71-82.000.

Esselink, Abraham J., to Selas Corporation. Reformer furnace. 3,672,847, Cl. 23-288.00m.

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Etat Francais represente par le Ministre des Armees Delegation Ministerielle pour l'Armement: *See—*
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Etherington, Robert W., Jr.; and Liauw, Koei-Liang, to Mobil Oil Corporation. Catalytic oxidative dehydrogenation of ketones with improved supported gold catalyst. 3,673,255, Cl. 260-586.00r.

Ethyl Corporation: *See—*
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Eversull, Richard F. Motor vehicle warm-up and battery charger system. 3,673,379, Cl. 219-202.000.

Ewald, William P.; Nerwin, Hubert; and Harvey, Donald M. Assemblage and pack for self-processing film units. 3,672,274, Cl. 95-13.000.

Export Tool & Welding Co., Limited: *See—*
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Ezy-Way Manufacturing & Sales Co.: *See—*
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Faarup, Peter: *See—*
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Factor, Arnold, to General Electric Company. Method for stabilizing pigmented polycarbonate resins. 3,673,146, Cl. 260-37.0pc.

Faggin, Federico: *See—*
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Fahrbach, Gerhard: *See—*
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Falkehag, Sten I.; Moorer, Howard H.; Prazak, Gerald; and Bailey, Carl W., III, to Westvaco Corporation. Alkylene chlorohydrin, oxide or carbonate modified sulfonated lignins in a disperse or vat dye cake. 3,672,817, Cl. 8-79.000.
Fanta, Wayne I.; and Erman, William F., to Procter & Gamble Company, The. Dihydro-π-santalol and process for preparing dihydro-π-santalol from 3-endo-methyl-3-exo (4'-methyl-5'-hydroxpentyl)norcamphor. 3,673,263, Cl. 260-631.500.
Fanta, Wayne I.; and Erman, William F., to Procter & Gamble Company, The. Process for preparing dihydro-β-santalol from 3-endo-methyl-3-exo(4'-methyl-5'-hydroxypentyl) norcamphor. 3,673,266, Cl. 260-631.500.
Faraci, Giorgio: *See—*
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Farrand, Clair L., to Inductosyn Corporation. Position-measuring transformer having end-detecting windings useful for positioning a magnetic head of a disc drive system. 3,673,584, Cl. 340-174.10c.
Faulkner, Eric Andrew, to Brookdeal Electronics Limited. Electronic phase sensitive detector circuits. 3,673,506, Cl. 329-103.
Faulstich, George W. Neck for wide-mouth jar and cap therefor. 3,672,528, Cl. 215-46.00a.
Fauth, Otto, to Otto Bilz, Werkzeugfabrik. Quick-change chucks. 3,672,692, Cl. 279-82.000.
Faxon, Robert C., to Texas Instruments, Incorporated. Composite thermistor temperature sensor having step-function response. 3,673,538, Cl. 338-25.
Fedders Corporation: *See—*
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Feddersen, Donald W.; and Markowski, Everett L., to Air Cargo Equipment Corporation, mesne. Cargo container. 3,672,529, Cl. 220-1.500.
Federal-Mogul Corporation: *See—*
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Feldstein, Nathan, to RCA Corporation. Method of preparing a substrate for depositing a metal on selected portions thereof. 3,672,925, Cl. 117-5.500.
Felten & Guilleaume Kabelwerke Aktiengesellschaft: *See—*
Levacher, Friedrich; Ditscheid, Hans Leo; Burger, Walter; Asselborn, Peter; and Cramer, Werner, 3,672,196.
Fenske, Ellsworth R.; and Sampson, Robert W., to Universal Oil Products Company. Determination and control of a composition characteristic while blending a multi-component combustible fluid. 3,672,840, Cl. 23-230.0pc.
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Feterl, Leon G. Cleaning and sorting machine for particulate materials. 3,672,505, Cl. 209-264.000.
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Findlay, David; and Fowler, Arnold L., to United States of America, Army, mesne. Equal impulse firearm. 3,672,255, Cl. 89-42.00r.
Fink, Anton. Height gauge. 3,672,620, Cl. 248-125.000.
Fink, Willi: *See—*
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Finkhauser, Dieter; and Friese, Andre, to Siemens Aktiengesellschaft. Call re-routing system for telephone installations. 3,673,341, Cl. 179-18.0be.
Fiorentino, Arthur A., to Thomas & Betts Corporation. Strap support. 3,672,615, Cl. 248-74.0pb.
Firestein, Harry; and Tyas, Karl, to Hand, Louis, Incorporated. Cloth transfer device. 3,672,313, Cl. 112-121.150.
Firestein, Harry; and Tyas, Karl, to Louis Hand Incorporated. Cloth stacking device. 3,672,314, Cl. 112-121.290.
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Fleissner, Heinz, to Vepa AG. Apparatus, such as a drawing unit or a calender dryer. 3,672,467, Cl. 184-1.00c.
Fleming, Robert W.: *See—*
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Florin, Walter. Writing instrument and indicator method. 3,672,842, Cl. 23-230.00r.
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Fourneron, Aime. Exercising apparatus. 3,672,361, Cl. 128-71.000.
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Freggens, Robert Alfred, to RCA Corporation. Method of making a heat pipe having an easily contaminated internal wetting surface. 3,672,020, Cl. 29-157.30r.
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Frick, Wilhelm Ernst; Weiss, Anton G.; Wenger, Thomas; and Traber, Walter, to Geigy Chemical Corporation. Biocidally active benzimidazole compounds. 3,673,209, Cl. 260-309.200.
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Froumajou, Armand P., to Automobiles Peugeot and Regie Nationale des Usines Renault. Rearwheel unit of a vehicle having independent wheels and trailing links. 3,672,698, Cl. 280-124.00a.
Fruengel, Frank. Method and arrangement for measuring the density of natural fog in the free atmosphere using light source which is also a flashing warning beacon. 3,672,775, Cl. 356-103.000.
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Fujimori, Yoshiaki, to Kabushiki Kaisha Suwa Seikosha. Synthetic resin watchcase with embedded metal reinforcement. 3,672,158, Cl. 58-90.00r.
Fujimoto, Hirozi: *See—*
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Fulk, James B. Matched plate method for printing on multiple paper parts. 3,672,299, Cl. 101-426.000.
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Halsall, Vincent Michael; and Cosme, Peter Anthony, to Globe-Union Inc. Method for fabricating battery cases. 3,673,302, Cl. 264-328.000.

Hamburg, Douglas R., to Ford Motor Company. Signal producing apparatus adaptable for use with variable reluctance motors. 3,673,476, Cl. 318-138.000.

Hamilton Company: *See—*
Ried, John D., 3,672,226.

Hamilton, James P., to FMC Corporation. Thermally stable air filter gels. 3,672,924, Cl. 106-287.000.

Hamilton Watch Company: *See—*
Bergey, John M.; and Walton, Richard S., 3,672,155.

Hammond, Earl J., to Houdaille Industries, Inc. Means for operating releasable tool chucks. 3,672,691, Cl. 279-1.0ts.

Hammond, Gary L. Simplified supercharged internal combustion engine with emissions control. 3,672,172, Cl. 60-282.000.

Hamouz, George J.; Dalenberg, W. Robert; and Zurek, James W., to International Harvester Company. Mower support and lift linkage. 3,672,137, Cl. 56-15.800.

Hanback, Francis J., to McDonnell Douglas Corporation. Tube cutter. 3,672,050, Cl. 30-99.000.

Hancke, Peter J.; Judkovics, Monroe; and Urquhart, Robert J., to International Business Machines Corporation. FFT Processor with unique addressing. 3,673,399, Cl. 235-156.000.

Hand, John James: *See—*
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Spicer, Larry Dean; and Hand, John James, 3,673,205.

Hand, Louis, Incorporated: *See—*
Firestein, Harry; and Tyas, Karl, 3,672,313.

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Burton, Paul T.; Cole, Walter E.; Frassetto, Henry E., Jr.; Gibson, Robert G.; Greenberg, Allan; Handloff, Louis E.; and Radlinsky, Raymond, 3,673,575.

Hanger, J. E., and Company Limited: *See—*
May, Denis Ronald William, 3,671,978.

Hann, George W.: *See—*
Stout, Beauford F.; and Hann, George W., 3,672,215.

Hansen, Howard C., to Clark Equipment Company. Front and side loading attachment for lifting trucks. 3,672,526, Cl. 214-730.000.

Hardin, James T., to Eltra Corporation. Dynamic braking for universal motors. 3,673,481, Cl. 318-246.000.

Harford, Jack Rudolph, to RCA Corporation. Gain controlled cascade-connected transistor amplifier. 3,673,498, Cl. 325-319.000.

Harmon, James R. Electric rocker switch for controlling multiple circuits with magnetic coupling members. 3,673,358, Cl. 200-6.00r.

Harrah, Robert S. Transducer with visible output. 3,672,325, Cl. 116-70.000.

Harrington, Richard H.: *See—*
Brumbaugh; Philip A.; Harrington, Richard H.; Nemier, Stanley E.; and Nielsen, Thomas C., 3,672,482.

Harris, Fred T.; and Resler, Edwin L., Jr., to United States of America, Army. Magnetically controlled proportional fluid amplifier. 3,672,387, Cl. 137-81.500.

Harris, Ronald D.; and Levine, Leon, to Procter & Gamble Company, The. Process for adsorbent bleaching of edible oils. 3,673,228, Cl. 260-428.000.

Harris, Thomas G. Mechanical oxidation of unsaturated polyesters. 3,673,138, Cl. 260-22.0tn.

Harrison, Robert E., to Leesona Corporation. Winding apparatus and method. 3,672,583, Cl. 242-18.00r.

Harsanyi, Kalman; Takacs, Kalman; Relle, Zsuzsa, nee Somfai; Milak, Eva, nee Krompecher; Tardos, Laszlo; Korbonits, Dezso; Kiss, Pal; and Gonczy, Csaba, to CHINOIN Gyogyszer-es Vegyeszeti Termekek Gyara R.T. Heterocyclic amidoximes. 3,673,188, Cl. 260/288/00r.

Hartley, Richard S.; and Houser, Franklin Douglass,, to Hobart Manufacturing Company, The. Speed increasing apparatus. 3,672,420, Cl. 146-182.000.

Hartman, Richard L., to United States of America, Army. System for measuring temperature of a cryogenic environment. 3,672,218, Cl. 73-362.0ar.

Hartmann, Frederick, to North American Rockwell Corporation. Measuring method and apparatus. 3,673,394, Cl. 235-151.300.

Hartwig, Karl; Engel, Herbert; and Schnall, Gunther, to Agfa-Gevaert Aktiengesellschaft. Electrostatic copier with removable cleaning module. 3,672,764, Cl. 355-15.000.

Harvey, Donald M.: *See—*
Ewald, William P.; Nerwin, Hubert; and Harvey, Donald M., 3,672,274.

Harvey, Donald M.; and McConaughey, Randall T., to Eastman Kodak Company. Sequential control for camera diaphragm and shutter. 3,672,267, Cl. 95-10.0ce.

Harwood, William H., to Continental Oil Company. Electroplating of aluminum. 3,672,965, Cl. 204-14.00n.

Harwood, William H.; and Banks, William P., to Continental Oil Company. Removal of molecular halogen from solution by passage through a membrane. 3,673,067, Cl. 204-180.00p.

Hasbro-Industries, Inc.: *See—*
Rizzo, Bartolo, 3,672,678.

Hasegawa, Haruo; Sugiyama, Kimroku; Suzuki, Kikuji; and Hirano, Kunio, to Tomoegawa Papaer Manufacturing Co., Ltd. Process for the manufacture of an electrophotographic sensitive material. 3,672,888, Cl. 96-1.800.

Hasegawa, Kohichi; and Kunishima, Norihiko, to Nippon Electric Company Limited. Information storage system. 3,673,580, Cl. 340-174.0pc.

Hasegawa, Tokushige; Makimoto, Kuninobu; Nihei, Seiji; and Takahira, Jiro, to Nisso Kinzoku Kabushiki Kaisha. Zinc dust for removal of cobalt from electrolyte. 3,672,868, Cl. 75-.50a.

Hastie, Austin: *See—*
Hastie, Willard A.; and Hastie, Austin, 3,672,481.

Hastie, Willard A.; and Hastie, Austin, to Coin Verifiers Company Limited. Variable magnetic flux coin-sensing devices. 3,672,481, Cl. 194-101.000.

Hatch, Gordon H., to Automation Industries, Inc. Ultrasonic search unit. 3,672,211, Cl. 73-71.500.

Hatch, Melvin J.: *See—*
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Hattori, Tsuyoshi: *See—*
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Hauck, Clifford A., to Union Carbide Corporation. Surface metal welding process and apparatus. 3,673,374, Cl. 219-76.000.

Haukedahl, Blane L. Combination table and serving bar. 3,672,719, Cl. 297-118.000.

Hauni-Werke Korber & Co. KG: *See—*
Dogl, Ernst; Funck, Albrecht; Wellach, Dieter; and Winkler, Hans-Georg, 3,672,373.
Wahle, Gunter; and Kasparek, Alois, 3,672,522.

Hawes, Edward L. Emergency sign assembly. 3,672,323, Cl. 116-28.

Hawkins, James Mitchell, to Frankenstein Group Limited. Inflatable body-attachments for marine lifesaving. 3,672,609, Cl. 244-122.0ae.

Hawkinson, Paul H.: *See—*
Hale, Everett W.; Hawkinson, Paul H.; and Robbeloth, Edward T., 3,672,653.

Hay, Allan S., to General Electric Company. 4-Phenyl 2-(2'-hydroxy-meta-terphenyl-5'-yl)-dibenzofuran and 4,4'-diphenyl-2,2'-bidibenzafuran. 3,673,219, Cl. 260-346.20m.

Hayase, Yoshio: *See—*
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Hayash, Edward F., Jr.; Reymore, Harold E., Jr.; and Sayigh, Adnan A. R., to Upjohn Company, The. Cellular polyoxazolidinone elastomers from polyisocyanates and polyepoxides. 3,673,128, Cl. 260-2.500.

Hayes, Michael Richard, to United Kingdom Atomic Energy Authority. Apparatus for grading particles according to their sphericity. 3,672,500, Cl. 209-116.000.

Hazeltine Corporation: *See—*
Maune, James J., 3,673,606.

Healy, Robert M.; and Marshall, Robert, to Bunker-Ramo Corporation, The. Electrical resistance element with a semiconductor overlay. 3,673,539, Cl. 338-154.000.

Heath, Darrell R.: *See—*
Orlando, Charles M.; Wirth, Joseph G.; and Heath, Darrell R., 3,673,202.

Hebard, Hugh Charles, to Aladdin Industries Limited. Liquid fuel burning heaters. 3,672,809, Cl. 431-34.000.

Heck, Raymond F.: *See—*
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Hedberg, Arthur S.: *See—*
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Hedin, Robert A.; and Dukes, Everett E., Jr., to Eaton Corporation. Multiplexer for controlling and monitoring coded key operated accesses. 3,673,569, Cl. 340-147.00r.

Hedrick, Glen W.: *See—*
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Heetmann & Finkensiep KG: *See—*
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Heffron, Donald B., to Aero-Flow Dynamics, Inc., mesne. Unitized air treating unit. 3,672,128, Cl. 55-222.

Heggy, Robert F.: *See—*
Keller, Thomas C.; and Heggy, Robert F., 3,672,735.

Heilweil, Israel J.: *See—*
Coty, Vernon F.; Heilweil, Israel J.; and Leavitt, Richard I., 3,672,953.

Heimlich, Henry J. Urinary drainage method. 3,672,372, Cl. 128-349.00r.

Heinzer, Hans, to Schweizerische Industrie-Gesellschaft. Device for the continuous production of packages. 3,672,120, Cl. 53-180.000.
Heiss-Thurow, E.: *See—*
Spindelberger, Franz, 3,672,258.
Heitz, Robert G.: *See—*
Brown, William E.; Heitz, Robert G.; and Levine, Charles A., 3,672,995.
Hellquist, Ivan A., to AGA Aktiebolag. Breathing gas regulator for aviators. 3,672,384, Cl. 137-39.000.
Hemdal, Goran Anders Henrik: *See—*
Edstrom, Nils Herbert; and Hemdal, Goran Anders Henrik, 3,673,577.
Hendershot, James R., to Vibrac Corporation. Electromagnetic clutch-brake devices. 3,672,476, Cl. 192-21.500.
Henderson, Albert E., Jr. Quick cure process for making superphosphates of low fluorine content. 3,672,828, Cl. 23-109.000.
Hendrickson, Melvin C., to Zenith Radio Corporation. Regulated D.C. power supply. 3,673,487, Cl. 321-18.000.
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Heraeus, W. C., GmbH: *See—*
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Hercules Incorporated: *See—*
Nixon, Joseph R., Jr., 3,672,961.
Herman, Hans, to Steel Company of Canada, Limited, The. Method and apparatus for wringing excess liquid from steel strip. 3,672,946, Cl. 117-102.001.
Herter, Eberhard, to International Standard Electric Corporation. Loop monitor circuit. 3,673,356, Cl. 179-175.000.
Hertz, Carl Hellmuth. Liquid jet recorder. 3,673,601, Cl. 346-75.
Hess, Karl Gunter, to Schneider, Jos., & Co. Optische Werke. Two-way drive for optical systems and the like. 3,673,483, Cl. 318-618.000.
Hester, Benny Lee, to Reynolds, R. J., Tobacco Company. Devices for weighing small objects. 3,672,456, Cl. 177-201.000.
Hester, Benny Lee, to Reynolds, R. J., Tobacco Company. Devices for weighing small objects. 3,672,457, Cl. 177-201.000.
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Hexcel Corporation: *See—*
Jackson, Wendell T.; Garrett, Beverley R.; and Vicars, Earl C., 3,673,058.
Hice, Jack O., Sr. Method of heat processing food. 3,672,908, Cl. 99-1.000.
Hicks, De Voe H. Bowling ball control device. 3,672,673, Cl. 273-54.00b.
Hicks, Harris Vernon; and Jones, Kenneth James, to Lucas, Joseph, Industries Limited. Lighting systems for road vehicles. 3,673,421, Cl. 250-229.000.
Hideaki Fukada, mesne: *See—*
Masuda, Yoshio; and Murakami, Toshikazu, 3,672,079.
High, Richard A.; and Vesper, George J., to McGraw-Edison Company. Continuous rinse and cool-down control. 3,672,189, Cl. 68-12.00r.
Higuchi, Akio: *See—*
Nakai, Shoji; and Higuchi, Akio, 3,672,589.
Hilberg, Ronald P., to TRW Inc. Laser with combined Q-switch and synchronized cavity dump circuit. 3,673,504, Cl. 328-210.000.
Hill, Charles P., to Leisure Group, Inc., The. Toy phonograph. 3,672,688, Cl. 274-14.000.
Hill, Edward D. Mounting preformed roller on shaft. 3,673,040, Cl. 156-294.000.
Hill, Harold Wayne, Jr.; and Campbell, Robert W., to Phillips Petroleum Company. Hydroxybenzensulfonyl halide production. 3,673,247, Cl. 260-543.00r.
Hilsum, Cyril: *See—*
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Hindermann, Peter; and Meindl, Hubert, to Ciba-Geigy AG. Acid anthraquinone dyestuffs. 3,673,221, Cl. 260-374.000.
Hinrichs, Jack F., to Hydro-Services, Inc. Hydro blast saf-t-gun. 3,672,575, Cl. 239-445.000.
Hinshaw, John W., to Battelle Development Corporation, The. Method and apparatus for shaping tubes. 3,672,201, Cl. 72-285.000.
Hinves, John R.: *See—*
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Hirano, Kunio: *See—*
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Hirt, Wilhelm; Lehnerdt, Hagen; Weckesser, Ernst; Weinhold, Gottfried; and Wrigge, Friedrich Wilhelm, to Vereingte Aluminium-Werke Aktiengesellschaft. Apparatus for improving the heat economy of an electrolytic cell for the production of aluminum. 3,673,074, Cl. 204-243.00r.
Hitachi, Ltd.: *See—*
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Kawabe, Ushio; Kimura, Hiroshi; Tomeoku, Hiroshi; and Doi, Toshio, 3,673,444.
Nishida, Hideko; Yamaguchi, Kunihiko; Kumasaka, Noriyuki; Sugita, Yutaka; and Fujiwara, Hideo, 3,673,581.
Ogawa, Hiroshi; Yamane, Sigeto; Nakagawa, Hisasi; and Uchida, Akinari, 3,672,355.
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Sakamoto, Yuzaburo; and Toyooka, Morio, 3,672,047.
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Seki, Susumu, 3,673,396.
Watai, Mitsuo; and Koya, Ito, 3,673,446.
Hiyama, Ryu, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument with expression control device for simultaneoulsy controlling different tone signals by different amounts. 3,672,253, Cl. 84-1.270.
Hjermstad, Hans U.; and Kopp, Carl J., to Clare, C. P., & Company, mesne. Actuator mechanism. 3,672,233, Cl. 74-2.000.
Hobart Manufacturing Company, The: *See—*
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Hock, Fromund, to Leitz, E., G.m.b.H. Firma. Device for indicating the position of two mechanical elements relative to one another. 3,672,779, Cl. 356-138.000.
Hoeffel, James D.; and Kubach, Reinhold W., to Dayton Electronic Products Company. Billing demand recorder. 3,673,607, Cl. 346-17.000.
Hoffman, Charles F. Wrench. 3,672,245, Cl. 81-367.000.
Hoffman, John P.; and Booth, Robert C., to Bethlehem Steel Corporation. One-probe method and apparatus for detecting correlating, and classifying defects in test members. 3,673,493, Cl. 324-37.000.
Hoffman, Leonard M.; and Kimball, John B., to United States of America, Navy, mesne. System for deployment of a spherical body from the nose of an accelerating ballistic vehicle. 3,672,605, Cl. 244-1.0ss.
Hoffmann, Anton R., to Gerrard, A. J., & Company. Feeding device for strapping machine. 3,672,596, Cl. 242-75.430.
Hoffmann-La Roche Inc.: *See—*
Uskokovic, Milan Radoje, 3,673,217.
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Andra, Rolf, 3,672,113.
Hofmann, Gottfried; and Stull, James T., to United States Steel Corporation. Guide-roll rack and supporting structure therefor. 3,672,438, Cl. 164-282.000.
Holan, Leif A., 1/3 to Wernz, William,, 1/3 to Miesbauer, Rudolph, 1/3 to Holan, Leif A.; stockholders of and Winona Industries, Inc. Woodworking machine. 3,672,415, Cl. 144-136.000.
Holan, Leif A.; stockholders of: *See—*
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Holm, Le Roy W., to Union Oil Company of California. Soluble oil composition. 3,673,124, Cl. 252-8.55d.
Holm, Wayne E., to Hydril Company, mesne. Remote terminal computing unit to compute B/A x C values, for use by central computer. 3,673,392, Cl. 235-150.500.
Holm, Wayne E., to Hydril Company, mesne. Net fluid computing unit for use with central computer. 3,673,574, Cl. 340-172.5.
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Holub, Fred F.: *See—*
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Holub, Fred F.; Berger, Abe; and Selin, Terry G., to General Electric Company. Bis organosilyl hydrocarbon modified polyamides and methods for making them. 3,673,155, Cl. 260-65.000.
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Hopkins, Evan Lloyd; Hopkins, Ross Eugene; and Hopkins, Evan Leon. Headlamp aiming device with orientation sensing. 3,672,063, Cl. 33-180.001.

Hopkins, Ross Eugene: *See—*
Hopkins, Evan Lloyd; Hopkins, Ross Eugene; and Hopkins, Evan Leon, 3,672,063.

Horgan, Stephen W.: *See—*
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Hornig, Hans Werner; and Walz, Kurt, to Lever Brothers Company. Process for the hydration of sodium tripolyphosphate. 3,672,826, Cl. 23-106.000.

Horst, William R.; and Schleicher, Lowell, to National Cash Register Company, The. Method and apparatus for recording and/or displaying images utilizing thermomagnetically-sensitive microscopic capsules. 3,673,597, Cl. 346-74.

Horton, Alfred A., to Barber-Colman Company. Single triac reversible motor control. 3,673,479, Cl. 318-208.000.

Horton, William H., to Eastman Kodak Company. Adapter for igniting electrically ignitable flashlamps. 3,672,813, Cl. 431-95.000.

Horvath, Edward; and Youngman, Gary, to Universal Oil Products Company. Method for the manufacture of solid phosphoric acid catalyst. 3,673,111, Cl. 252-435.000.

Hosokawa, Ryoji: *See—*
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Houck, Clarence W.: *See—*
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House, Robert L. Tunnel boring apparatus. 3,672,726, Cl. 299-31.000.

Houser, Franklin Douglass,: *See—*
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Hovestad, Adrian P. Self-extending dockboard. 3,671,990, Cl. 14-71.000.

Howard, Lawrence A. Clock mechanism actuated by successively supplied ball weights. 3,672,149, Cl. 58-2.000.

Howe, John Arthur; and Bryan, Leslie Oliver, to TRW Inc. Electrical switch. 3,673,368, Cl. 200-67.00g.

Hoya Glass Works, Limited: *See—*
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Ishiguri, Hachiro, 3,672,920.

Hoyt, Donald L., to Texaco Inc. Interface advance control in secondary recovery program by reshaping of the interface between driving and driven fluids and by the use of a dynamic gradient barrier. 3,672,448, Cl. 166-245.000.

Hrach, Joseph, to Sandoz Ltd. Process for the production of injection moulded and extrusion moulded polyester products. 3,673,139, Cl. 260-22.00r.

Hron, Roland L., to Honeywell Inc. Burner control system using a radiation operated relay means. 3,672,811, Cl. 431-69.000.

Hubbell, Harvey, Incorporated: *See—*
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Huber, J. M., Corporation: *See—*
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Hubinger Company, The: *See—*
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Hubner, Kurt, to Ebauches Electroniques S.A. Electric time-piece. 3,672,154, Cl. 58-23.0ba.

Hudson, Ben A.: *See—*
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Hudson, Ronald Augustus, to Imperial Chemical Industries Limited. Method of thermally processing a comestible product. 3,672,907, Cl. 99-1.000.

Huffstetter, Jean M. Remedial reading teaching device. 3,672,074, Cl. 35-35.00h.

Hufnagel, Fred M.: *See—*
Britton, Ralph H., Jr., 3,673,475.

Huggins, David Anthony; and Curlook, Walter, to International Nickel Company, The. Separation of nickel from cobalt. 3,672,873, Cl. 75-101.00r.

Hughes, William C., to General Electric Company. Wide frequency response line scan magnetic deflector. 3,673,528, Cl. 335-210.000.

Huml, James O.; and Layne, Gilbert S., to Dow Chemical Company, The. Production of polymeric fibers or coherent thin deposit of a silicon and oxygen compound. 3,672,832, Cl. 23-182.000.

Humphrey, John G., to General Electric Company. Video compensation circuit for emphasized-carrier detector. 3,673,319, Cl. 178-5.40r.

Hung, Ya-Ya: *See—*
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Hunt, David H., to Spencer Turbine Company, The. Tool holder. 3,672,616, Cl. 248-75.000.

Hunter, Richard I.: *See—*
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Hydro-Services, Inc.: *See—*
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Hymore, Frank J.: *See—*
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Ichiryu, Ken; and Takenoshita, Mitsuaki, to Hitachi, Ltd. Accumulator for absorbing a pulsation of pump pressure. 3,672,398, Cl. 137-586.000.

ICP, Inc.: *See—*
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Ihasz, Richard: *See—*
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Ihm, Joseph M. Gelled alcohol fuel containing nitrocellulose and boric acid. 3,672,851, Cl. 44-7.00b.

Ijlstra, Hendrik J.: *See—*
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Ikawa, Kenji; and Takami, Fumitaka, to Shinonogi & Co., Ltd. Process for preparing dialkylaminoalkoxycarbonium tetrafluoroborate. 3,673,234, Cl. 260-453.00r.

Imai, Hiroko: *See—*
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Imperial Chemical Industries, Limited: *See—*
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Brian, Robert Coles; and Bland, Peter Douglas, 3,673,087.
Buckley, Alan; and Thomas, Ieuan, 3,673,162.
Doyle, Peter; and Stacey, Joseph Gilbert, 3,673,198.
Hudson, Ronald Augustus, 3,672,907.
Komoly, Thomas John, 3,673,032.
Palluel, Auguste Louis Luciene, 3,673,137.

Imura, Toshinori, to Minolta Camera Kabushiki Kaisha. Camera with retractable lens barrel. 3,672,280, Cl. 95-39.000.

Indian Head Inc.: *See—*
Neth, Richard M.; Rogers, John M.; and Gallagher, James J., 3,672,011.

Inductorsyn Corporation: *See—*
Tripp, Robert W., 3,673,395.

Inductosyn Corporation: *See—*
Farrand, Clair L., 3,673,584.
Tripp, Robert W.; and Geller, Robert Z., 3,673,585.

Industrial Tools, Inc.: *See—*
Nielsen, Waldemar R.; and Mathias, Charles D., 3,672,017.

Industrie Perelli S.p.A., mesne: *See—*
Oriani, Agostino, 3,672,613.

Industrie Pirelli S.p.A., mesne: *See—*
Angioletti, Attilio E.; and Marocco, Sergio G., 3,672,484.

Industrierwerk Schaeffler OHG: *See—*
Jacob, Werner, 3,672,737.

Ingeniorsfirman Nils Weibull AB: *See—*
Andersson, Sven A., 3,672,518.

Ingmarson, Martin, to Kooperativa forbundet ekonomisk forening. Method and machine for packaging goods. 3,672,116, Cl. 53-3.000.

Inland Steel Company: *See—*
Levy, Bernard S., 3,673,009.

Inmot Corporation: *See—*
Ackerman, Joseph Francis; Weisfeld, Joseph; Savageau, Robert George; and Beerli, George, 3,673,140.

Inoue, Eiichi; Yamaji, Keizo; Tanaka, Hiroshi; and Saito, Takashi, to Canon Camera Kabushiki Kaisha. Apparatus for electrostatic image-forming and processes for use therewith. 3,673,595, Cl. 346-74.

Institut de Recherches de la Siderurgie Francaise: *See—*
Bojic, Milan; and Jorre, Daniel, 3,672,774.

Institutul de Cercetari Pentru Prelucrarea titeiului: *See—*
Georgescu, Eugenia; Gheja, Ion; Bugur, Victor; Zirna, Ion; Mazare, Theodora; Popescu, Elena-Lygia; Olteanu, Bujor; Marculescu, Nicolae; Filotti, Traian-Mircea; Barbul, Marius-Aurel; and Calin, Ion, 3,673,109.

Institutul de Ceretari Tehnologice Pentru Constructii de Masini: *See—*
Dumitrescu, Traian, 3,673,004.

Instrumentation Laboratory, Inc.: *See—*
Rosse, Thomas A.; and Blackmer, David E., 3,672,843.

Interlake, Inc.: *See—*
Weller, Frank C., 3,672,295.

Interlake Steel Corporation: *See—*
Wognum, James N.; Simich, Emil; and Winkler, Alvin L., 3,672,436.

Interlectron Corporation, mesne: *See—*
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International Business Machines Corporation: *See—*
Berglund, Neil C.; King, Robert W.; and Swearingen, Kent W., 3,672,297.
Brumbaugh, Philip A.; Harrington, Richard H.; Nemier, Stanley E.; and Nielsen, Thomas C., 3,672,482.
Burton, Paul T.; Cole, Walter E.; Frassetto, Henry E., Jr.; Gibson, Robert G.; Greenberg, Allan; Handloff, Louis E.; and Radlinsky, Raymond, 3,673,575.
De Witt, David; Dhaka, Vir A.; and Oberai, Avtar S., 3,672,983.

DeJong, Egbert D.; Koch, Hans; and Maynard, Kenneth B., 3,672,118.
Di Stefano, Edmund J.; and Enderley, Arthur E., 3,673,542.
Foehring, Robert A.; Garnache, Richard R.; and Kenney, Donald M., 3,672,948.
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International Harvester Company: *See—*
Hamouz, George J.; Dalenberg, W. Robert; and Zurek, James W., 3,672,137.
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International Nickel Company, The: *See—*
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International Paper Company, mesne: *See—*
Brown, Stirling Robert, 3,672,949.
Brown, Stirling Robert; and Lee, Charles A., 3,672,952.
Brown, Stirling Robert, 3,673,026.
Murhpy, James A.; and Brown, Stirling Robert, 3,672,950.
Murphy, James A.; and Brown, Stirling Robert, 3,673,060.

International Playtex Corporation: *See—*
Berger, Leonard; Fitzpatrick, William E.; McGinley, James H.; Pfund, Adolf; and Schwartzberg, Ira G., 3,672,122.

International Standard Electric Corporation: *See—*
Herter, Eberhard, 3,673,356.
Le Strat, Guy Jean; and Desplanques, Roger, 3,673,333.
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International Telephone and Telegraph Corporation: *See—*
Barr, John E., 3,672,024.
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Ionics Incorporated, mesne: *See—*
Freeman, Donald C., Jr.; and Rogers, Louis J., 3,672,841.

Isaac, Olivier, to Societe Industrielle Generale de Mecanique Appliquee S.I.G.M.A. Variable ratio hydrostatic transmissions. 3,672,166, Cl. 60-53.00r.

Ise Electronics Corporation: *See—*
Nakamura, Tadashi, 3,673,448.

Ishiguri, Hachiro, to Hoya Glass Works, Limited. Optical glass having a high refractive index and a low dispersion. 3,672,920, Cl. 106-47.00q.

Ishihara, Teruo: *See—*
Yoneda, Naoto; Ishihara, Teruo; Kobayashi, Tetsuji; Kondo, Yasuzo; Okumura, Kentaro; Kojima, Michio; and Nose, Takashi, 3,673,195.

Istituto Nazionale Chimico Biologico S.r.l.: *See—*
Grippa, Leonida, 3,672,954.

Isuzu Motors Limited: *See—*
Yamanouchi, Yuichi, 3,672,338.

Itek Corporation: *See—*
Archambault, Jean-Paul C.; and Holmes, William S., 3,672,899.

Ito, Osamu, to Nippondenso Kabushiki Kaisha. Slip ratio calculating device. 3,673,400, Cl. 235-196.000.

Ito, Yutaka; and Hirate, Jun, to Tokyo Broadcasting System, Inc.; and and Nippon Electric Company, Limited. Video mixing/special effects amplifiers. 3,673,324, Cl. 178-6.800.

Itoki, Nobuo: *See—*
Abe, Kaoru; Matsumoto, Takeji; and Itoki, Nobuo, 3,672,115.

Iwakura, Hikozo: *See—*
Komeno, Taichiro; and Iwakura, Hikozo, 3,673,173.

Iwami, Ichiro; Honda, Toshio; and Fukuura, Yukio, to Bridgestone Tire Company Limited. Process for adhering a polyester fibrous material with a rubber. 3,673,022, Cl. 156-166.000.

Iwashita, Hidemaro: *See—*
Seko, Maomi; Yomiyama, Akira; Miyake, Tetsuya; and Iwashita, Hidemaro, 3,673,068.

Izumi, Takahiro: *See—*
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Izumitani, Tetsuro: *See—*
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Jablin, Richard; and Leister, Robert G., to Allan Wood Steel Company. Drag wipe. 3,672,595, Cl. 242-75.200.

Jacknow, Burton B.: *See—*
Ciccarelli, Roger N.; and Jacknow, Burton B., 3,672,883.

Jackson, Wendell T.; Garrett, Beverley R.; and Vicars, Earl C., to Hexcel Corporation. Honeycomb having laminates of unidirectional strands. 3,673,058, Cl. 161-68.000.

Jacob, George M.: *See—*
Storey, William T., II; Procter, Robert F.; Snyder, Charles H. A.; Jacob, George M.; and Mooney, Raymond T., 3,672,046.

Jacob, Herbert: *See—*
Bauer, Rudolf; Jacob, Herbert; and Braun, Werner, 3,672,495.

Jacob, Werner, to Industrierwerk Schaeffler OHG. Ball bearing. 3,672,737, Cl. 308-196.000.

Jacobsen Manufacturing Company: *See—*
Akgulian, Sahag C.; and Haffner, Donald G., 3,672,696.

Jaeschke, Ralph L., to Eaton Corporation. Method of making pole members. 3,672,042, Cl. 29-602.000.

Jaffe, Christopher; and Gehry, Frank O. Acoustical system employing tubular resonators. 3,672,463, Cl. 181-30.000.

Jagenberg-Werke AG: *See—*
Klapp, Hartmut, 3,672,266.

Jagers, Leopold. Saw. 3,672,251, Cl. 83-169.000.

Jaggers, Brian George: *See—*
Janes, John Francis; Jaggers, Brian George; and Curtis, Anthony John, 3,673,120.

Jago, Edward John: *See—*
Cooley, Kenton Parkes; and Jago, Edward John, 3,672,427.

Jagob, Karl, to Paul Ferd. Peddinghaus. Parallel vise. 3,672,660, Cl. 269-203.000.

Janda, Clifford C. Leveler. 3,672,618, Cl. 248-116.000.

Janes, John Francis; Jaggers, Brian George; and Curtis, Anthony John, to Bush Boake Allen Limited. Perfumery compositions containing patchouli oil and 8-camphene carbinol. 3,673,120, Cl. 252-522.000.

Janiak, Stefan, to Ciba Limited. 2,4-Dinitro-6-alkyl phenylcyclopropionates. 3,673,237, Cl. 260-468.00p.

Janich, Hans Jurgen, to Polysius G.m.b.H. Apparatus for purifying dust loaded waste gases. 3,672,502, Cl. 209-144.000.

Janssen, Peter Johannes Hubertus, to U.S. Philips Corporation. Television receiver with a phase detector having dual phase determining and correcting networks. 3,673,321, Cl. 178-5.80a.

Japan Exlan Company Limited: *See—*
Shimoda, Keitaro; Tsutsui, Nobuhiro; Sekiguchi, Hideto; and Sone, Masao, 3,673,053.

Japan Furnace Industry Co. Ltd.: *See—*
Miyazaki, Shuzo, 3,672,808.

Japan Steel Works Ltd.: *See—*
Miyano, Katao; and Shimazaki, Masahide, 3,673,007.

Japanese Geon Company, Ltd., The: *See—*
Tanaka, Akira; Hattori, Tsuyoshi; Anno, Hirotomo; and Kawahara, Testuyo, 3,673,283.

Jefferson, Leo J.; and Crosby, Lenard J., 1/2 to said Crosby and 1/2 to Cook, Harold E. Butcher's pneumatic bone dust vacuum cleaner. 3,672,576, Cl. 239-521.

Jeffreys, Roy A.; and Mellows, Susan M., to Eastman Kodak Company. Novel dyes and photographic emulsions. 3,672,905, Cl. 96-140.000.

Jenaer Glaswerk Schott & Gen.: *See—*
Sack, Werner, 3,672,919.

Jentzsch, Dietrich: *See—*
Frank, Peter; Jentzsch, Dietrich; and Kurger, Helmut, 3,672,227.

Jerabek, Elihu C., to General Electric Company. Sealed metallic oxide-indium secondary battery. 3,672,997, Cl. 136-20.000.

Jerrold Electronics Corporation, mesne: *See—*
Ticknor, Sergei L., 3,673,517.

Jeths, Johannes: *See—*
Von Der Eltz, Hans-Ulrich; Jeths, Johannes; and Boecker, Alfons Bernhard, 3,672,815.

Joa, Curt G. Method of making a laminated mat from plies of fibrous pulp material. 3,673,021, Cl. 156-62.400.

Joannes, Giuseppe, to Gruppo Finanziario Termico Fin-Term S.p.A. Heat generator of the smoke-tube type. 3,672,336, Cl. 122-149.

Joel, Amos Edward, Jr., to Bell Telephone Laboratories, Incorporated. Switching of time division multiplex lines and analog trunks through telephone central offices. 3,673,335, Cl. 179-15.0aq.

Joesting, Frederick D., to Honeywell Inc. Multi-unit pneumatic control system. 3,672,567, Cl. 236-1.00c.

Johmann, Frank T. Dolls. 3,672,096, Cl. 46-120.000.

Johns Hopkins University, The: *See—*
Rabenhorst, David W., 3,672,241.

Johns-Manville Corporation: *See—*
Spencer, Samuel Binford, 3,673,027.

Johnson, Bernard G. Adjustable corrugated shipping container and or adjustable cardboard shipping carton. 3,672,558, Cl. 229-37.00r.

Johnson, Bruce K., to Polaroid Corporation. Photographic apparatus for processing film material. 3,672,275, Cl. 95-13.000.

Johnson, Clarence S.; and McKinley, Larry E. Full view diver's mask. 3,671,976, Cl. 2-14.00c.

Johnson, Donald Edgar, to Delapena Honing Equipment Limited. Honing tools. 3,672,102, Cl. 51-204.000.

Johnson, Edward P., to Earl and Wright. Deep sea mining method and apparatus. 3,672,725, Cl. 299-8.000.

Johnson, Lee F.: *See—*
Miller, Alfred H.; and Johnson, Lee F., 3,673,044.

Johnson, Matthew & Co., Limited: *See—*
Darling, Alan Sydney; and Selman, Gordon Leslie, 3,672,880.

Johnson, Peter Bennett: *See—*
Cairns, Hugh; and Johnson, Peter Bennett, 3,673,218.

Johnson, Ralph G.; and Fryberger, David, to United States of America, Atomic Energy Commission. Touch actuable data input panel assembly. 3,673,327, Cl. 178-18.000.

Johnson, Ray M., to Cryodry Corporation. Microwave applicator system with cylindrical resonant cavity. 3,673,370, Cl. 219-10.55.

Johnson, Royce F.: *See—*

Webb, Cleitus E., Jr.; and Johnson, Royce F., 3,672,098.

Johnson, William E.; and Schmersal, Larry J., to Owens-Illinois, Inc. Low voltage pulse system for addressing gas discharge display/memory panels. 3,673,460, Cl. 315-169.00r.

Johnstone, Colin G. Circuit for operating polyphase induction motors from single phase supply. 3,673,480, Cl. 318-221.00g.

Jonas, John J.; and Freund, Ernest H., to Kraftco Corporation. Emulsifier system. 3,673,106, Cl. 252-356.000.

Jones & Laughlin Steel Corporation: *See—*
Schraeder, Albin E., 3,672,216.

Jones, Frank D., to United States of America, Army. Adjustable mount for auxiliary gun sight. 3,672,623, Cl. 248-226.00r.

Jones, Giffin D.; Geyer, Gerald R.; and Hatch, Melvin J., to Dow Chemical Company, The. 2-Methylene-3-butenyl quaternary ammonium monomers and polymers. 3,673,164, Cl. 260-80.30n.

Jones, Kenneth James: *See—*
Hicks, Harris Vernon; and Jones, Kenneth James, 3,673,421.

Jonsson, Per Gustaf: *See—*
Ekbergh, Evert Oskar; and Jonsson, Per Gustaf, 3,673,338.

Jorre, Daniel: *See—*
Bojic, Milan; and Jorre, Daniel, 3,672,774.

Joslyn Mfg. and Supply Co.: *See—*
Misare, Donald O., 3,673,311.

Jouppi, Eino J. Device for delimbing trees. 3,672,413, Cl. 144-2.00f.

Juchmann, Heinz; and Lauterbach, Peter, to Licentia Patent-Verwaltungs-G.m.b.H. Silicon wafer cell. 3,673,308, Cl. 174-52.00s.

Juckniess, Paul R., to Dow Chemical Company, The. Filter press fluorine cell with carbon connectors. 3,673,076, Cl. 204-256.

Judkovics, Monroe: *See—*
Hancke, Peter J.; Judkovics, Monroe; and Urquhart, Robert J., 3,673,399.

Judson Jewelry Corporation: *See—*
Manceri, John, 3,672,157.

Junk, Dieter; Schlunke, Jurgen; and Boixen, Heinz, to Kleinewefers, Joh., Sohne Maschinenfabrik. Guiding roller for calenders. 3,672,018, Cl. 29-116.0ad.

Jylhavaara Osakeyhtio: *See—*
Syrjanen, Ahti, 3,672,506.

Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See—*
Klebl, Wolfram, 3,672,230.

Kabushiki Kaisha Ideal: *See—*
Sato, Yoshio, 3,672,382.

Kabushiki Kaisha Kamitsu Seisakusho: *See—*
Nakai, Shoji; and Higuchi, Akio, 3,672,589.

Kabushiki Kaisha Sasakiseisakusho: *See—*
Sasaki, Tadajiro, 3,672,249.

Kabushiki Kaisha Suwa Seikosha: *See—*
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Kabushiki Kaisha Tadano: *See—*
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Kabushiki Kaisha Tsuchiya Seisakusho: *See—*
Saito, Nobuo; and Namiki, Kyoji, 3,672,510.

Kabushikikaisha Tokyo Keiki Seizosho: *See—*
Miura, Takahiro; and Yamamoto, Miaki, 3,673,553.

Kachita Co., Ltd.: *See—*
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Kadison Laboratories, Inc.: *See—*
Delaney, William E., 3,672,914.

Kai, Junjiro: *See—*
Awazu, Kenzo; Matsunaga, Kazu; Muto, Katsutoshi; Kai, Junjiro; and Oi, Kyoko, 3,673,103.

Kaiser Aluminum & Chemical Corporation: *See—*
Dorsey, Geoffrey A., Jr., 3,672,972.

Kaiser, Carl; and Zirkle, Charles L., to Smith Kline and French Laboratories. Substituted 7,12, dihydropleialine derivatives. 3,673,176, Cl. 260-240.0tc.

Kaiser, Hermann, to Eaton Corporation. Crash sensor. 3,673,367, Cl. 200-61.45r.

Kaiser, Reinhold, to Telefunken Patentverwertungsgesellschaft m.b.H. Method of producing a transistor. 3,673,012, Cl. 148-187.000.

Kallenbach, Rudolf Paul. Copper immersion coating on aluminum. 3,672,976, Cl. 117-130.00r.

Kallrath, Gottfried; Knorre, Helmut; Meyer-Simon, Eugen; and Biegler, Hanns. Process for the non-electrolytic metallizing of non-conductors. 3,672,937, Cl. 117-47.

Kalopissis, Gregoire; De Raymond, Henri Philippe; Abegg, Jean-Louis; and Ghilardi, Giuliana, to Societe Anonyme dite: L'Oreal. Treatment of damaged hair with methylol compounds. 3,672,375, Cl. 132-7.000.

Kaltenbach & Voigt: *See—*
Eibofner, Eugen; Fink, Willi; and Farian, Gerhard, 3,672,060.

Kamas Kvarnmaskiner AB: *See—*
Nordstrand, Leif Roland, 3,672,516.

Kamenir, Melvin: *See—*
Bartok, Stephen; Kamenir, Melvin; and Begoss, Andrew J., 3,673,350.

Kammann, Wilfried. Screen printing machine for printing cylindrical and canical articles. 3,672,296, Cl. 101-38.00a.

Kammerer, Heinz, to Bosch, Robert, G.m.b.H. Astable switching circuit. 3,673,564, Cl. 340-81.00r.

Kanegafuchi Boseki Kabushiki Kaisha: *See—*
Matsui, Maso; Utsuhara, Yutaka; Yamabe, Masahiro; and Tokura, Susuma, 3,672,802.

Takahashi, Kenji; Yamamura, Toshio; Ono, Mitsuzo; and Eda, Korekiyo, 3,673,125.

Kapsambelis, Christos Basil; and Collins, David Janett,, to Computer Identics Corporation. Identification and registration system. 3,673,389, Cl. 235-61.11r.

Kardon, Emanuel S. Means for applying adhesive to paper bags or the like. 3,672,328, Cl. 118-221.000.

Karr, Michael A. Valve operator apparatus. 3,672,262, Cl. 92-140.000.

Kasei Kogyo Kabushiki Kaisha: *See—*
Katsuyama, Shigeo; Asami, Atsumi; Watanabe, Masahide; Sato, Tsutomu; Norimatsu, Toshiaki; and Nakajima, Eizo, 3,672,819.

Kashiwagi, Nobuo: *See—*
Miura, Yasushi; Kashiwagi, Nobuo; and Mochizuki, Zenichi, 3,672,440.

Kasparek, Alois: *See—*
Wahle, Gunter; and Kasparek, Alois, 3,672,522.

Katesu, Isao: *See—*
Sagane, Norio; Kuwazuru, Issei; and Katesu, Isao, 3,673,129.

Kato, Hiroshi: *See—*
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Kato, Tsutomu: *See—*
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Katsuyama, Shigeo; Asami, Atsumi; Watanabe, Masahide; Sato, Tsutomu; Norimatsu, Toshiaki; and Nakajima, Eizo, to Kasei Kogyo Kabushiki Kaisha. Process for shaping a bundle wet-spun continuous filaments. 3,672,819, Cl. 8-137.000.

Katz, Carlos: *See—*
Eager, George S., Jr.; Silver, David A.; and Katz, Carlos, 3,673,307.

Kaufman, Harold C.: *See—*
Schlinger, Warren G.; and Kaufman, Harold C., 3,673,080.

Kaufman, Jack W. Cutter and like article. 3,672,054, Cl. 30-294.000.

Kaus, Carl M.: *See—*
Sullivan, Bruce M.; and Kaus, Carl M., 3,672,130.

Kawabe, Ushio; Kimura, Hiroshi; Tomeoku, Hiroshi; and Doi, Toshio, to Hitachi, Ltd. Rotary electric machine. 3,673,444, Cl. 310-10.000.

Kawahara, Testuyo: *See—*
Tanaka, Akira; Hattori, Tsuyoshi; Anno, Hirotomo; and Kawahara, Testuyo, 3,673,283.

Kawakami, Hiroshi, to Sony Corporation. Magnetic recording and reproducing apparatus. 3,672,684, Cl. 274-4.00d.

Kawaminani, Kohachi. Container sealing device. 3,672,121, Cl. 53-351.000.

Kawasaki, Akihiro; Ueda, Hiroaki; and Taniguchi, Masanobu, to Maruzen Petrochemical Co., Ltd. Process for preparing an alternating copolymer of butadiene and acrylonitrile. 3,673,165, Cl. 260-82.5.

Kay, Edward L.: *See—*
Lohr, Delmar Frederick, Jr.; Crane, Grant; and Kay, Edward L., 3,673,269.

Kaye, George W.; and Shonnard, John R., to Litton Systems, Inc. Stylus assembly for electrically recording of information. 3,673,593, Cl. 346-74.0es.

Kaye, Seymour M.: *See—*
Lane, George A.; Smith, William Arthur; Dollman, Stephen C.; Kaye, Seymour M.; and Taylor, Francis R., 3,673,013.

Kays, David D., to Aerojet-General Corporation. Multiple effect distillation systems. 3,672,960, Cl. 203-11.000.

Kazan, Benjamin, to International Business Machines Corporation. Photocopying device. 3,673,594, Cl. 346-74.0mt.

Keady, Frederick D.; and Wellman, Ellis M. Combination brake warning switch and proportioning valve. 3,672,728, Cl. 303-6.00c.

Keith, Jack G., to Duke, Inc. Simplified continuous rendering system. 3,673,227, Cl. 260-412.600.

Keller, Emil C.; and Spokes, Raymond E., to Abex Corporation. Friction elements. 3,673,276, Cl. 260-38.000.

Keller, James R., to Baldwin Tool, Inc. Shelf bracket structure. 3,672,624, Cl. 248-243.000.

Keller, Robert H., to Owens-Illinois, Inc. Glass gob shaping and delivering means. 3,672,860, Cl. 65-208.000.

Keller, Thomas C.; and Heggy, Robert F., to Timken Company, The. Bearing housing. 3,672,735, Cl. 308-180.000.

Kelley, James K.: *See—*
Mashikian, Matthew S.; Kelley, James K.; and McMurray, William C., 3,673,305.

Kelso, James W., to Xatron Corporation. Automatic film processing apparatus. 3,672,289, Cl. 95-89.00d.

Kennametal Inc.: *See—*
McCreery, James F., 3,672,784.

Kennedy, Frank; and Roberts, Thomas C., to United States Steel Corporation. Roller conveyor. 3,672,486, Cl. 198-127.000.

Kennedy, Paul G.: *See—*
Newell, George F.; and Kennedy, Paul G., 3,673,317.

Kenney, Donald M.: *See—*
Foehring, Robert A.; Garnache, Richard R.; and Kenney, Donald M., 3,672,948.

Kern, David W.: *See—*
Stelts, Philip D.; and Kern, David W., 3,672,222.

Kern, Richard W., to International Business Machines Corporation. Optical system for positional and angular orientation determining apparatus. 3,672,778, Cl. 356-138.000.

Kerrigan, James A., to Leesona Corporation. Winding apparatus. 3,672,585, Cl. 242-27.000.

Kersten, Karl-Heinz; and Patschan, Wolfgang, to Telefunken Patentverwertungsgesellschaft m.b.H. Emitter electrode current controlled amplitude modulator. 3,673,515, Cl. 332-31.00t.

Kesling, Peter C. Arch wire annealer. 3,673,378, Cl. 219-156.000.

Keuffel & Esser Company: *See—*
Baker, Allister L., 3,672,062.

Keulen, Gerben Jan, to Bull General Electric Nederland N.V. Large-capacity card supply magazines comprising a device for retaining and transferring cards. 3,672,668, Cl. 271-61.000.

Keystone-Seneca Wire Cloth Company: *See—*
Krebs, William B., 3,672,638.

Kibby, Robert M., to Reynolds Metals Company. Alumina reduction system. 3,673,075, Cl. 204-245.000.

Kida, Nobutoshi; and Saito, Kazo. Collapsible umbrella capable of automatic opening. 3,672,381, Cl. 135-22.000.

Kidder, Ray E.: *See—*
Gregg, David W.; Kidder, Ray E.; and Krawetz, Barton, 3,673,513.

Kim, Dae Sik. System for producing substantially pollution-free hot gas under pressure for use in a prime mover. 3,672,160, Cl. 60-13.000.

Kimball, John B.: *See—*
Hoffman, Leonard M.; and Kimball, John B., 3,672,605.

Kimberly-Clark Corporation: *See—*
Roeder, Robert J., 3,672,371.

Kimbrough, Laurence B., to RCA Corporation. Method of mounting a mass in a cathode-ray tube using retractable spacing units. 3,672,014, Cl. 29-25.150.

Kimura, Hiroshi: *See—*
Kawabe, Ushio; Kimura, Hiroshi; Tomeoku, Hiroshi; and Doi, Toshio, 3,673,444.

Kincaid, James U.: *See—*
Hair, George D.; and Kincaid, James U., 3,673,331.

Kindlimann, Lynn E.; and Greene, Alexander B., to Allegheny Ludlum Steel Corporation. Nitride strengthened stainless steel composite and production thereof. 3,672,037, Cl. 29-497.500.

King, George W. Automatic hook setting device. 3,672,085, Cl. 43-15.000.

King, Robert W.: *See—*
Berglund, Neil C.; King, Robert W.; and Swearingen, Kent W., 3,672,297.

King, William M.; and Cantor, Paul A., to Aerojet-General Corporation. Reverse osmosis and process and composition for manufacturing cellulose acetate membrane wherein the swelling agent is a di- or tri-basic aliphatic acid. 3,673,084, Cl. 210-23.000.

Kinjo, Hisao: *See—*
Wada, Yoshiyo; Kinjo, Hisao; Suzuki, Toshi; and Akuwa, Fumio, 3,673,352.

Kinney, Alfred W.; and Williams, James W., to Phillips Petroleum Company. Container and closure therefor. 3,672,536, Cl. 220-60.00r.

Kinsinger, William Charles, to Metagraphic Systems, Inc. Film viewer. 3,672,756, Cl. 353-68.000.

Kirk, Merrit C., Jr., to Sun Oil Company. Process for producing high UR oil by hydrogenation of dewaxed raffinate. 3,673,078, Cl. 208-89.000.

Kirkpatrick, Milton E., to TRW Inc. Fluid heat transfer method and apparatus for semi-conducting devices. 3,673,306, Cl. 174-15.00r.

Kise, Mearl A.; and Ellis, Leonard C., to Virginia Chemicals, Inc. Sodium dithionite solution stabilization. 3,672,829, Cl. 23-116.000.

Kiss, Pal: *See—*
Harsanyi, Kalman; Takacs, Kalman; Relle, Zsuzsa, nee Somfai; Milak, Eva, nee Krompecher; Tardos, Laszlo; Korbonits, Dezso; Kiss, Pal; and Gonczy, Csaba, 3,673,188.

Kistler Instrumente AG: *See—*
Spescha, Gelli A., 3,672,223.

Kitzner, Ernest W., to Ford Motor Company. Fuel tank vapor separator system having pivoting arm vapor pickup. 3,672,537, Cl. 220-85.0vr.

Kizer, Joseph Austin A.: *See—*
Burke, Oliver W., Jr.; Kizer, Joseph Austin A.; and David, Pauls, 3,673,168.

Klapp, Hartmut, to Jagenberg-Werke AG. System for erecting the bottom flaps of folding-box blanks. 3,672,266, Cl. 93-49.00r.

Klassen, Hans. Hydrant valve assembly. 3,672,393, Cl. 137-307.000.

Klebl, Wolfram, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Method and apparatus for testing production of high frequency cables. 3,672,230, Cl. 73-506.000.

Kleer-Vu Industries, Inc., mesne: *See—*
Lakin, Harold, 3,672,771.

Klein, Kenneth R., to Westinghouse Electric Corporation. Transformer slide switch with contact clamping means. 3,673,364, Cl. 200-16.00c.

Klein, Thomas; and Faggin, Federico, to Fairchild Camera and Instrument Corporation. Doped semiconductor electrodes for MOS type devices. 3,673,471, Cl. 317-235.00r.

Kleinewefers, Joh., Sohne Maschinenfabrik: *See—*
Junk, Dieter; Schlunke, Jurgen; and Boixen, Heinz, 3,672,018.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Matzen, Max, 3,672,385.

Klosa, Josef, to Fischer & Fischer G.m.b.H., mesne. Ketones of the thiamine series and their production. 3,673,185, Cl. 260-256.50b.

Knaak, Rudiger, to Koppers-Wistra-Ofenbau Gesellschaft mit Beschrankter Haftung. Soaking pit furnace. 3,672,654, Cl. 263-40.00r.

Knapp, Alfons. Device for aerating a jet of water. 3,672,574, Cl. 239-428.500.

Knigge, Wayne I.: *See—*
Blixrud, John O.; Knigge, Wayne I.; Rustad, Stanley C.; and Tsuchiya, Takuzo, 3,672,294.

Knit Tech Development Corporation: *See—*
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Knorre, Helmut: *See—*
Kallrath, Gottfried; Knorre, Helmut; Meyer-Simon, Eugen; and Biegler, Hanns, 3,672,937.

Knowles, Frederick G.; and Taylor, Clarence R., to Eastman Kodak Company. Selective scanning control for projection apparatus. 3,672,593, Cl. 242-67.400.

Knowles, James, to Ford Motor Company. Motor vehicle steering system. 3,672,697, Cl. 280-87.00a.

Kobayashi, Katuei: *See—*
Osoegawa, Hideru; and Kobayashi, Katuei, 3,673,478.

Kobayashi, Shoichi: *See—*
Takahashi, Akira; Kojima, Hiroo; Ogawa, Masao; Osuka, Hiroshi; and Kobayashi, Shoichi, 3,673,279.

Kobayashi, Tatsuo, to Minolta Camera Kabushiki Kaisha. Device for identifying photographic size. 3,672,277, Cl. 95-31.00r.

Kobayashi, Tetsuji: *See—*
Yoneda, Naoto; Ishihara, Teruo; Kobayashi, Tetsuji; Kondo, Yasuzo; Okumura, Kentaro; Kojima, Michio; and Nose, Takashi, 3,673,195.

Koch, Hans: *See—*
DeJong, Egbert D.; Koch, Hans; and Maynard, Kenneth B., 3,672,118.

Kock, Klaus, to Bosch, Robert, G.m.b.H. Process for the preparation of gas permeable hydrophobic foils for electrochemical cells. 3,673,292, Cl. 264-49.000.

Koehring Company: *See—*
Bennett, Charles H., 3,672,437.

Kofahl, David C., to Richfield Oil Corporation. Marine well drilling method and apparatus. 3,672,447, Cl. 166-.500.

Koivunen, Erkki A., to General Motors Corporation. Fail safe brake anti-lock modulator. 3,672,731, Cl. 303-21.

Kojima, Hiroo: *See—*
Takahashi, Akira; Kojima, Hiroo; Ogawa, Masao; Osuka, Hiroshi; and Kobayashi, Shoichi, 3,673,279.

Kojima, Michio: *See—*
Yoneda, Naoto; Ishihara, Teruo; Kobayashi, Tetsuji; Kondo, Yasuzo; Okumura, Kentaro; Kojima, Michio; and Nose, Takashi, 3,673,195.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
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Kollmorgen Corporation: *See—*
Zeblisky, Rudolph J., 3,672,923.
Zeblisky, Rudolph John, 3,672,938.

Komeno, Taichiro; and Iwakura, Hikozo, to Shionogi & Co., Ltd. Process for preparation of 2α,3α-epithiosteroid. 3,673,173, Cl. 260-239.500.

Komoly, Thomas John, to Imperial Chemical Industries Limited. Process for the production of thermoplastic sheets having longitudinal and transverse corrugations. 3,673,032, Cl. 156-210.000.

Kondo, Kenshi. Thermostat switch. 3,673,536, Cl. 337-392.000.

Kondo, Yasuzo: *See—*
Yoneda, Naoto; Ishihara, Teruo; Kobayashi, Tetsuji; Kondo, Yasuzo; Okumura, Kentaro; Kojima, Michio; and Nose, Takashi, 3,673,195.

Konishi, Kozo; Otake, Michio; Maeda, Tatuo; and Maruyama, Kuniaki, to Denki Kagaku Kogyo Kabushiki Kaisha. Process for preparing a pigment coated paper. 3,672,941, Cl. 117-62.000.

Konrath, Karl: *See—*
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Kooperativa forbundet ekonomisk forening: *See—*
Ingmarson, Martin, 3,672,116.

Kopczynski, John F. Straightening machine for elongated workpieces. 3,672,411, Cl. 140-147.

Kopp, Carl J.: *See—*
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Koppers, Heinrich, Gesellschaft mit beschrankter Haftung: *See—*
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Koppers-Wistra-Ofenbau Gesellschaft mit Beschrankter Haftung: *See—* Knaak, Rudiger, 3,672,654.

Korb, Klaus: *See—*
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Korbonits, Dezso: *See—*
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Korn, Franklin Adam, to Bell Telephone Laboratories, Incorporated. Artificial line busy circuit. 3,673,339, Cl. 179-18.00f.

Korth, Jurgen, to Bukama GmbH. Nailing tool. 3,672,555, Cl. 227-120.000.

Koshiba, Masao: *See—*
Yamamoto, Hisao; Hirohashi, Atsuko; Izumi, Takahiro; and Koshiba, Masao, 3,673,243.

Kosmowski, Wojciech B., to Advanced Controls Corporation. Centrifugal chuck device. 3,672,256, Cl. 90-11.00a.

Kost, Robert A., to City of Fort Collins. . 3,672,103, Cl. 52-20.000.

Koya, Ito: *See—*
Watai, Mitsuo; and Koya, Ito, 3,673,446.

Kozlowski, Robert L. Container with replaceable plug and pouring spout. 3,672,547, Cl. 222-567.000.

Kraftco Corporation: *See—*
Jonas, John J.; and Freund, Ernest H., 3,673,106.

Kramer, Walter W., to Fuller Company. Fluid bed grid plate assembly. 3,672,577, Cl. 239-557.000.

Krawetz, Barton: *See—*
Gregg, David W.; Kidder, Ray E.; and Krawetz, Barton, 3,673,513.

Krebs, Peter Eric, to Solartron Electronic Group Limited, The. Pulse counters. 3,673,390, Cl. 235-92.0sh.

Krebs, William B., to Keystone-Seneca Wire Cloth Company. Snow fence. 3,672,638, Cl. 256-12.500.

Kreml, John F., to Armco Steel Corporation. Chemical milling method and bath for steel. 3,673,094, Cl. 252-79.400.

Kretschmar, Herbert C.; and Erman, William F., to Procter & Gamble Company, The. Perfume compounds and process for preparing same. 3,673,261, Cl. 260-617.00f.

Kretschmer, Peter: *See—*
Caspary, Rudolf; and Kretschmer, Peter, 3,672,212.

Kriisa, Paul: *See—*
Halling, Roy Walker Lee; and Kriisa, Paul, 3,672,317.

Krohn, Charles. Whirlpool bath attachment. 3,672,359, Cl. 128-66.000.

Krohn, Helmut: *See—*
Burckhardt, Manfred H.; Florus, Hans-Jorg; Grossner, Horst; and Krohn, Helmut, 3,672,730.

Kroopp, Karl-Gunnar, to Grafiset System AB. Coupling for connecting together building units. 3,672,710, Cl. 287-56.000.

Krueger, Archie S.; and Slye, Norman J., to Alwin Manufacturing Company, Inc. Dispenser for web of perforated toweling sheets. 3,672,552, Cl. 226-129.000.

Krueger Associates: *See—*
Krueger, Eugene C., 3,672,055.

Krueger, Eugene C., to Krueger Associates. Hand punching device for data cards. 3,672,055, Cl. 30-358.000.

Krueger, Paul C. Sequence electronic combination lock. 3,673,466, Cl. 317-134.000.

Kruesi, Paul R., to Cyprus Metallurgical Processes Corporation. Process for the recovery of metals from sulfide ores through electrolytic dissociation of the sulfides. 3,673,061, Cl. 204-105.00r.

Krusche, Alfred; and Rosslein, Helmuth, to Linde Aktiengesellschaft. Control system for a stepless hydrostatic drive. 3,672,161, Cl. 60-19.000.

Krzyzanowski, Robert A., to Milprint, Inc. Carton with pull-spout wall construction. 3,672,557, Cl. 229-17.00r.

Kubach, Reinhold W.: *See—*
Hoeffel, James D.; and Kubach, Reinhold W., 3,673,607.

Kuhn, Stephen Joseph, to Dow Chemical Company, The. Method of preparing optically active propylene chlorohydrins and propylene oxides. 3,673,264, Cl. 260-633.000.

Kujawa, Anthony, Jr., to Production Research, Inc., mesne. Ventilator unit. 3,672,291, Cl. 98-2.16.

Kullmann, Jean-Claude. Method for attaching the inner end of a balance spring to its collet. 3,673,376, Cl. 219-121.0lm.

Kumasaka, Noriyuki: *See—*
Nishida, Hideko; Yamaguchi, Kunihiko; Kumasaka, Noriyuki; Sugita, Yutaka; and Fujiwara, Hideo, 3,673,581.

Kunishima, Norihiko: *See—*
Hasegawa, Kohichi; and Kunishima, Norihiko, 3,673,580.

Kunkel, Wolfgang: *See—*
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Kunst, Helmut, to Elektroschmelzwerk Kempten G.m.b.H. Process for borating metals, especially steel. 3,673,005, Cl. 148-6.000.

Kupetis, Raymond F.: *See—*
Weston, Donald E.; and Kupetis, Raymond F., 3,673,426.

Kupfer, Hanspeter, to Albiswerk Zurich AG. Circuit arrangement for selectively connecting at least two inputs to a counting stage possessing at least one preparatory input and one triggering input and including contact bounce suppression circuitry. 3,673,433, Cl. 307-247.00a.

Kupsky, Fredrick E.: *See—*
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Kurger, Helmut: *See—*
Frank, Peter; Jentzsch, Dietrich; and Kurger, Helmut, 3,672,227.

Kurz, Richard Karl, to Eastman Kodak Company. Vacuum treatment of coated, direct-positive silver halide elements. 3,672,895, Cl. 96-64.000.

Kurz, Richard Karl, to Eastman Kodak Company. Fogged, direct-positive emulsion production by increased flow of silver halide-forming precipitants in grain-ripener-free acidic medium. 3,672,900, Cl. 96-94.000.

Kuwano, Sadaichi. Fine cloisonne. 3,672,967, Cl. 204-38.00c.

Kuwazuru, Issei: *See—*
Sagane, Norio; Kuwazuru, Issei; and Katesu, Isao, 3,673,129.

La Marche, Robert Ernest; and May, Carl Jerome, Jr., to Bell Telephone Laboratories, Incorporated. Common control digital echo suppression. 3,673,355, Cl. 179-170.600.

Laboratories de L'Ozothine: *See—*
Muller, Pierre, 3,673,066.

Ladenberger, Volker: *See—*
Bronstert, Klaus; Ladenberger, Volker; and Fahrbach, Gerhard, 3,673,281.

Ladish Co.: *See—*
Zimmerly, Robert D., 3,672,791.

Lagerwey, Johannes; Ijlstra, Hendrik J.; and Andriesse, George F. J., to Reactor Centrum Nederland (Stichting). Vibration dampers for rapidly rotating bodies of revolution. 3,672,472, Cl. 188-1.

Laing, Clyde A., Jr. Ladder latching device. 3,672,612, Cl. 248-361.00r.

Lajoye, Pierre. Method for the centrifugal casting of metal in a rotating horizontal shell. 3,672,429, Cl. 164-63.000.

Lakin, Harold, to Kleer-Vu Industries, Inc., mesne. Aperture card duplicator apparatus. 3,672,771, Cl. 355-100.000.

Lalinga, Nicholas: *See—*
Tepper, Sidney; and Lalinga, Nicholas, 3,672,092.

Lamb, John T.; and Anderson, Carl L., to Tappan Company, The. Energization system with safety provision for faulty rectifier. 3,673,464, Cl. 317-43.000.

Lambert, William J. Random access article selection of system and apparatus therefor. 3,672,497, Cl. 209-80.500.

Lanahan, John H.; and Abraham, William W., to Mohawk Industrial Laboratories, Inc. Card sorting device and method. 3,672,498, Cl. 209-80.500.

Land, Edwin H., to Polaroid Corporation. Reflex camera. 3,672,281, Cl. 95-42.000.

Land, Edwin H., to Polaroid Corporation. Photographic apparatus. 3,672,283, Cl. 95-11.00r.

Land, Edwin H., to Polaroid Corporation. Novel photographic products and processes. 3,672,890, Cl. 96-3.000.

Landbouwerktuigen-en Machine-Fabriek H. Vissers N.V.: *See—*
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Landis Tool Company, mesne: *See—*
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Lane, George A.; Smith, William Arthur; Dollman, Stephen C.; Kaye, Seymour M.; and Taylor, Francis R., said Lane and said Smith assors. to Dow Chemical Company, The said Dollman, said Kaye and said Taylor assors. to United States of America, Army. Illuminating flare composition. 3,673,013, Cl. 149-19.000.

Lane, George A.; and Smith, William Arthur, to Dow Chemical Company, The. Flare composition. 3,673,014, Cl. 149-19.000.

Langhammer, Arthur C. Spinal area back supporter and massaging device. 3,672,360, Cl. 128-67.000.

Lankford, David L.: *See—*
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Larkin, Thomas J., to Cartridge Television, Inc., mesne. Video tape pick-up and guide system for cartridge type reproducing and/or recording system. 3,673,348, Cl. 179-100.20f.

Larry, John R., to Du Pont de Nemours, E. I., and Company. Method of improving line resolution in screen printing. 3,672,934, Cl. 117-38.000.

Lasley, James A., to Belden Corporation. Shielded cable. 3,673,315, Cl. 174-107.000.

Lassell, Robert W.: *See—*
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Lauckhardt, Gerhard: *See—*
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Lauterbach, Peter: *See—*
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Lawrence, William G.: *See—*
Corvi, Joseph A.; and Lawrence, William G., 3,673,590.

Lawver, James E., to University of Minnesota, The Regents of the. Process for beneficiating magnetite iron ore. 3,672,579, Cl. 241-24.000.

Layne, Gilbert S.: *See—*
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Lazar, Jeffrey M., to Honeywell Inc. Fuel injection apparatus. 3,672,339, Cl. 123-119.00r.

Le Strat, Guy Jean; and Desplanques, Roger, to International Standard Electric Corporation. Acounting system for telephonic exchanges. 3,673,333, Cl. 179-7.00r.

Lea-Ronal, Inc.: *See—*
Nobel, Fred I.; and Ostrow, Barnet D., 3,672,969.

Leach, Sam L., to Spectra-Tech Corporation. Electroluminescent techniques and devices. 3,673,450, Cl. 313-108.00a.

Leavitt, Richard I.: *See—*
Coty, Vernon F.; Heilweil, Israel J.; and Leavitt, Richard I., 3,672,953.

Lecher, Hans Z.: *See—*
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Leclanche S.A.: *See—*
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Lederman, Sol J.: *See—*
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Ledoux, Claude; and de Vries, Albert, to Produits Chimiques Pechiney Saint Gobain. Polyvinyl chloride fibers. 3,673,167, Cl. 260-92.8.

Lee, Art, to General Electric Company. Time and light controlled switching circuit. 3,673,413, Cl. 250-206. 00.

Lee, Charles A.: *See—*
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Lee, Franics F. Communication system. 3,673,326, Cl. 178-71.00r.

Lee, Raymond, Organization, Inc.: *See—*

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Lee, Raymond, Organization, Inc., The: *See—*
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Parlagreco, Thomas J., 3,672,376.
Lee, Richard G., to Addressograph-Multigraph Corporation. Roll feeding and cutting apparatus for use in a photocopy machine. 3,672,770, Cl. 355-97.000.
Lee, Robert E.: *See—*
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Morton, Robert E., 3,672,586.
Whitney, William R., 3,672,143.
Lehmann, Willi; and Ryan, Frederick M., to Westinghouse Electric Corporation. Cathodoluminescent calcium sulfide compositions with improved fast decay characteristic. 3,673,102, Cl. 252-301.40s.
Lehnerdt, Hagen: *See—*
Hirt, Wilhelm; Lehnerdt, Hagen; Weckesser, Ernst; Weinhold, Gottfried; and Wrigge, Friedrich Wilhelm, 3,673,074.
Leidenfrost, Wolfgang, to United States of America, Air Force. Determination of heat transfer through fluids. 3,672,205, Cl. 73-15.00a.
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Levacher, Friedrich; Ditscheid, Hans Leo; Burger, Walter; Asselborn, Peter; and Cramer, Werner, to Felten & Guilleaume Kabelwerke Aktiengesellschaft. Method and apparatus for making corrugations in tubes consisting of ductile material. 3,672,196, Cl. 72-77.000.
Levedahl, William J.: *See—*
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Linsen, Bastiaan Gerardus; and Osinga, Theo Jan, 3,673,115.
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Levy, Bernard S., to Inland Steel Company. Method for producing a part from steel sheet. 3,673,009, Cl. 148-12.300.
Levy, Marilyn, to United States of America, Army. Color printing method. 3,672,766, Cl. 355-32.000.
Lewis, John B.; and Hedrick, Glen W., to United States of America, Agriculture. Hydroxyl-terminated hydroxymethylabietanyl adipate. 3,673,240, Cl. 260-485.00g.
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Lieberman, Irving, to Whittaker Corporation. Method of fabricating a tube sheet assembly. 3,672,035, Cl. 29-471.300.
Lieberman, Marvin Frank, to Du Pont de Nemours, E. I., and Company. Preparation of photosensitive coated papers by single pass per side. 3,672,933, Cl. 117-34.000.
Liebertz, Wolfgang; and Starr, Anthony J., to Container Corporation of America. Apparatus for forming a stackable container. 3,672,799, Cl. 425-330.000.
Lif-O-Gen, Inc.: *See—*
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Likins, Keith L., to Ohio State University, The. Sonic tool apparatus. 3,672,454, Cl. 175-56.000.
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Lilly, Eli, and Company: *See—*
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Limberg, Allen Le Roy, to RCA Corporation. Synchronous demodulator employing a common-base transistor amplifier. 3,673,505, Cl. 329-50.000.
Limberger, Walter, to Lumoprint Zindler KG. Copying apparatus. 3,672,761, Cl. 355-3.000.
Lin, Kingso Chingtsung, to Hooker Chemical Corporation. Preparation of vinyl organo-phosphorous compounds. 3,673,285, Cl. 260-970.000.
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Lindelow, Claes-Goran, to Svenska Dataregister AB. Setting device. 3,673,388, Cl. 235-92.00r.
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Berg, Peter; and Linder, Bertil C., 3,673,349.
Linger, Harrison K. Artist's tool conditioning structure. 3,671,992, Cl. 15-104.920.
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Duba, Erwin; and Fischer, Conrad, 3,672,311.
Linsen, Bastiaan Gerardus; and Osinga, Theo Jan, to Lever Brothers Company. Catalysts. 3,673,115, Cl. 252-459.000.
Linville, Roy Norman, to Truck Equipment Corporation. Refuse packer body. 3,672,520, Cl. 214-82.000.
Lipe, Jerome G., to Celanese Corporation. Method and apparatus for forming article filled with filament fiberfill. 3,673,036, Cl. 156-250.000.
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Little, Ernest Lewis, Jr., to Du Pont de Nemours, E. I., and Company. Submicron ferromagnetic alloy particles containing cobalt, boron, and zinc. 3,672,867, Cl. 75-.5aa.
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Livingston, Richard W.; and Michaels, George L. Automatic chemical feeder apparatus. 3,672,391, Cl. 137-240.000.
Llop, Helenio, to Societe d'Optique, Precision, Electronique et Mecanique-Sopelem. Apparatus for sensing a change in light intensity. 3,672,777, Cl. 356-135.000.
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Louvel, Guy, to Compagnie Industrielle des Telecommunications. Housing for transistors having unsoldered connections for operating at very high frequencies. 3,673,470, Cl. 317-234.00r.
Louzos, Demetrios V., to Union Carbide Corporation. Rechargeable alkaline galvanic cell and electrolyte therefor. 3,672,996, Cl. 136-6.000.
Lovett, Donald S., to McGraw-Edison Company. Weld support for welding apparatus. 3,673,373, Cl. 219-74.
Lowe, Leonard F., to Patterson-Kelley Co., Inc., The. Water heating system. 3,672,444, Cl. 165-39.000.
Lowry, Terrell Nicholson, to Bell Telephone Laboratories, Incorporated. Piston mercury switch. 3,673,524, Cl. 335-52.000.
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Lugo, Roberto. Combination shaper blade and support therefor. 3,672,417, Cl. 144-218.

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MacDonald, William A., Jr. Device and method for handling a flexible photoconductor. 3,672,758, Cl. 355-3.000.

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Mancuso, Henry. Caddy for holding pipe cleaners. 3,672,374, Cl. 131-243.000.

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Marand, Jean, to Ciba-Geigy Corporation. Air pressure operated dispenser. 3,672,545, Cl. 222-193.000.

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Marinace, Robert C. Double life light bulbs, fuses, and the like. 3,673,534, Cl. 337-258.000.

Mark, Andre. Centrifugal separator for fibrous material. 3,672,503, Cl. 209-144.000.

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Mason, Allen C. Infant feeding device. 3,672,052, Cl. 30-130.000.

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Miller, Alfred H.; and Johnson, Lee F., to Libbey-Owens-Ford Company. Producing interlayers for antenna type windshields. 3,673,044, Cl. 156-433.000.

Miller, Alfred H., to Esso Research and Engineering Company. 1,2,4-Thiadiazolyl ureas. 3,673,203, Cl. 260-306.80d.

Miller and Company: *See—*
Brown, William A.; and Drenning, John F., 3,672,871.

Miller, Arthur, to RCA Corporation. Digital light deflector using optical resonators. 3,672,746, Cl. 350-163.000.

Miller, Daniel D.; Miller, Donald D.; and Wrenn, James M., to Miller Scientific Corporation. Sensing solenoid grading scheme. 3,672,076, Cl. 35-48.00b.

Miller, Donald D.: *See—*
Miller, Daniel D.; Miller, Donald D.; and Wrenn, James M., 3,672,076.

Miller, Forbes M.: *See—*
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Miller, Frederick Warren: *See—*
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Miller, Howard L.: *See—*
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Miller, Keith A.: *See—*
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Miller, Richard C., to Nalco Chemical Company. NTA solid support for $B_2S$ removal. 3,672,125, Cl. 55-73.000.

Miller, Richard G., to PPG Industries, Inc. Electroless process for forming thin metal films. 3,672,939, Cl. 117-54.000.

Miller, Robert E.; and Phillips, Paul S., Jr., to National Cash Register Company. Pressure-sensitive record material. 3,672,935, Cl. 117-36.800.

Miller Scientific Corporation: *See—*
Miller, Daniel D.; Miller, Donald D.; and Wrenn, James M., 3,672,076.

Mills, Alfred Leonard; and Vivers, Robert William Jackson, to United Kingdom Atomic Energy Authority. Processing of irradiated nuclear fuels. 3,672,848, Cl. 23-342.000.

Mills, Justin W., Jr.: *See—*
Strople, Gordon N.; and Mills, Justin W., Jr., 3,672,129.

Milprint, Inc.: *See—*
Krzyzanowski, Robert A., 3,672,557.

Mimeault, Victor J.: *See—*
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Mims, Samuel S., to El Paso Products Company. Treatment of off-gases from nitric acid oxidation of anolone. 3,673,245, Cl. 260-531.00r.

Minagawa, Motonobu; Nakagawa, Kenichi; and Goto, Minoru, to Argus Chemical Corporation. Enhancement of resistance of olefin polymers to copper-catalyzed oxidative degradation. 3,673,152, Cl. 260-45.80n.

Minami, Muneyoshi; Taniguchi, Masaharu; Tsutsomi, Tadao; Murakami, Masakazo; and Yoshii, Toshiya, to Toray Industries, Inc. Polyimide solution and method of preparing same. 3,673,145, Cl. 260-32.40n.

Minami, Shinsaku; Shono, Toshihiro; Shmmizu, Masanao; and Takase, Yoshiyuki, to Dainippon Pharmaceutical Co., Ltd. Certain 2-substituted-5,8-dihydro-5-oxopyrido [2,3-d] pyrimidine-6-carboxylic acid derivatives. 3,673,184, Cl. 260-247.20r.

Minart, Paul, to Societe Grenobloise d'Etudes et d'Applications Hydrauliques (Sogreah). Method and apparatus for treating solutions by solid-ion exchangers. 3,673,085, Cl. 210-33.000.

Miner, William W. Apparatus for harvesting sod. 3,672,452, Cl. 172-19.000.

Minnesota Mining and Manufacturing Company: *See—*
Wirth, Wayne M., 3,673,583.
Wright, Donald A., 3,673,437.

Minnis, Ralph L.: *See—*
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Minolta Camera Kabushiki Kaisha: *See—*
Imura, Toshinori, 3,672,280.
Kobayashi, Tatsuo, 3,672,277.
Naya, Mikio; Yamaguchi, Haruki; and Horie, Izumi, 3,672,217.
Yamanaka, Akira, 3,672,278.
Yamanoi, Yorio, 3,672,329.

Minton, Robert G.; and Melamed, Sidney, to Rohm & Haas Company. Elastomeric materials and process therefor. 3,673,280, Cl. 260-878.00r.

Mirjanic, Milorad, to Daimler-Benz Aktiengesellschaft. Cylinder block for liquid-cooled internal combustion engines with inserted cylinder liner. 3,672,263, Cl. 92-144.000.

Misare, Donald O., to Joslyn Mfg. and Supply Co. Corona free coupling assembly for coaxial cables. 3,673,311, Cl. 174-73.00r.

Mitchell, Harry Ian; and Tomlinson, Kenneth, to Colgate-Palmolive Company. Method and compositions for cleaning ovens and the like. 3,672,993, Cl. 134-3.000.

Mitchell, Robert K., to Battelle Development Corporation, The. Fluid pressure control. 3,672,796, Cl. 418-26.000.

Mitoff, Stephan P., to General Electric Company. Sodium-sulfur cell with third electrode. 3,672,994, Cl. 136-6.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Awazu, Kenzo; Matsunaga, Kazu; Muto, Katsutoshi; Kai, Junjiro; and Oi, Kyoko, 3,673,103.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Abe, Kaoru; Matsumoto, Takeji; and Itoki, Nobuo, 3,672,115.

Miura, Takahiro; and Yamamoto, Miaki, to Kabushikikaisha Tokyo Keiki Seizosho. Measuring instrument for piloting ship for docking or leaving. 3,673,553, Cl. 340-3.00r.

Miura, Yasushi; Kashiwagi, Nobuo; and Mochizuki, Zenichi, to Toshiba Kikai Kabushiki Kaisha. Apparatus for die casting ferrous metals. 3,672,440, Cl. 164-312.000.

Miyake, Tetsuya: *See—*
Seko, Maomi; Yomiyama, Akira; Miyake, Tetsuya; and Iwashita, Hidemaro, 3,673,068.

Miyano, Katao; and Shimazaki, Masahide, to Japan Steel Works Ltd. Method for manufacturing a high toughness steel without subjecting it to heat treatment. 3,673,007, Cl. 148-12.000.

Miyasaka, Mamoru, to Kabushiki Kaisha Suwa Seikosha. Break prevention device for calendar advancing of a calendar watch. 3,672,156, Cl. 58-58.000.

Miyazaki, Shuzo, to Japan Furnace Industry Co. Ltd. Method and apparatus of continuous steam-atomizing fuel combustion for boiler furnace. 3,672,808, Cl. 431-2.000.

Mobil Oil Corporation: *See—*
Chen, Nai Yuen; and Smith, Fritz A., 3,673,267.
Coty, Vernon F.; Heilweil, Israel J.; and Leavitt, Richard I., 3,672,953.
Etherington, Robert W., Jr.; and Liauw, Koei-Liang, 3,673,255.
Manning, William F., 3,672,177.
McAlpin, Silvan E., 3,673,554.

Mochida, Hisashi, to Daito Mfg. Co., Ltd. Fuse melt type damper device for intercepting flow through a duct. 3,672,386, Cl. 137-77.000.

Mochizuki, Zenichi: *See—*
Miura, Yasushi; Kashiwagi, Nobuo; and Mochizuki, Zenichi, 3,672,440.

Modena, Mario: *See—*
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Modrey, Henry J. Foil wrapped coil spring. 3,672,493, Cl. 206-46.00h.

Moeller & Neumann GmbH: *See—*
Buchheit, Otto Karl, 3,672,489.

Moertel, George B.; and Wilson, James R., to Textron, Inc. Slide fastener stop assembly. 3,672,008, Cl. 24-205.11.

Moggre, Anthonie Jannis, to U.S. Philips Corporation. Circuit arrangement comprising switching means for periodically interrupting a current supplied to an inducting coil. 3,673,458, Cl. 315-27.00r.

Mohawk Industrial Laboratories, Inc.: *See—*
Lanahan, John H.; and Abraham, William W., 3,672,498.

Mohler, Edwin C.: *See—*
Martin, Eugene G.; and Mohler, Edwin C., 3,672,000.

Moilanen, Veikko Mauri, to Enso-Gutzeit Osakeyhtio. Method of producing a laminate for use as a layer in a corrugated board. 3,673,031, Cl. 156-206.

Molchan, Andrew John, to Bell Telephone Laboratories, Incorporated. Tactile response switch with unitary contact strip of independently operable plural disc contacts. 3,673,357, Cl. 200-5.00a.

Molex Products Company: *See—*
McDonough, Cletus G., 3,673,551.

Moller, Paul S., to Discojet Corporation. Exhaust muffler and spark arrestor. 3,672,773, Cl. 181-58.000.

Monpetit, Louis A., to Societe des Procedes Modernes d'Injection Sopromi. Electronic injection-controlling system for internal combustion engines. 3,672,345, Cl. 123-32.0ea.

Monsanto Company: *See—*
Baer, Massimo, 3,673,282.

Baker, Joseph W.; and Bachman, Gerald L., 3,673,200.
Benson, Royal H., 3,673,100.
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Moore Business Forms Inc.: *See—*
Gill, Edward W.; and Vincent, Derek A., 3,672,483.

Moore, Eugene R.; Bussey, Marlin G.; and Parish, Hal G., to Dow Chemical Company, The. Roofing structure and method. 3,672,951, Cl. 161-160.000.

Moore, George E., to General Electric Company. Burner-cooler system for generating exothermic gas. 3,672,839, Cl. 23-281.000.

Moore, Harold R.; and Fischer, Heinz G. Methods of manufacturing electrical insulating structures. 3,673,297, Cl. 264-138.000.

Moore, R. D., to R-J-R, Corporation. Blood product for fish bait. 3,672,910, Cl. 99-3.000.

Moore, Vern E. Frangible in-flight arrow head cover. 3,672,677, Cl. 273-106.50r.

Moore, William H.: *See—*
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Moorer, Howard H.: *See—*
Falkehag, Sten I.; Moorer, Howard H.; Prazak, Gerald; and Bailey, Carl W., III, 3,672,817.

Moorman, Charles J.; and Reuter, Fred A., to Bendix Corporation, The. Gas inlet system for a mass spectrometer. 3,673,405, Cl. 250-41.90s.

Moran, James G. Inflatable and illuminable figure. 3,672,083, Cl. 40-126.00b.

Moran, John J., to Hycel, Inc. Clutch. 3,672,477, Cl. 192-27.000.

Morand, Jean-Pierre: *See—*
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Morel, Richard William Victor: *See—*
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Morgan, Bevly Boone. Bank mask helmet. 3,672,365, Cl. 128-141.00r.

Morgan, Paul W.: *See—*
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Morgan, Thomas E., to International Telephone and Telegraph Corporation. Cable strap. 3,672,003, Cl. 24-16.0pb.

Morgan, Wendell D., to Fedders Corporation. Dishwasher spray arm with integral beating. 3,672,573, Cl. 239-261.000.

Morgenstern, Dieter: *See—*
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Mori, Takeshi: *See—*
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Moriya, Tosio: *See—*
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Morlock, Elizabeth Benz; and Goldman, Leon, to American Cyanamid Company. Substituted 4-(anilinomethylene)-3-galanthamaninones. 3,673,177, Cl. 260-240.300.

Morlock, Elizabeth Benz; Albright, Jay Donald; and Goldman, Leon, to American Cyanamid Company. Derivatives of 1,4,4a,9b-dimethyl-2-phenyl-1-1,4-ethanobenzofuro [3,2-c] pyridine-3(2h), 10-dione. 3,673,194, Cl. 260-293.550.

Morris, Elias J., Jr. Hooked stick figure and handle for catching and projecting same. 3,672,675, Cl. 273-96.

Morris, Herbert, Limited: *See—*
Davey, Anthony Walter, 3,673,482.

Morris, Jerome R.: *See—*
O'Keeffe, Terence W.; and Morris, Jerome R., 3,672,987.

Morris, Rupert C.; and Mason, Ronald F., to Shell Oil Company. Secphosphine dithiophosphinic acid salts. 3,673,231, Cl. 260-420.900.

Morrocco, Joseph J., III: *See—*
Allam, James N.; and Morrocco, Joseph J., III, 3,672,582.

Morton, Robert E., to Leesona Corporation. Winding apparatus. 3,672,586, Cl. 242-27.000.

Moss, Merton. Combination radiographic apparatus. 3,673,408, Cl. 250-61.500.

Motorola, Inc.: *See—*
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Riff, James A., 3,673,588.

Moulopoulos, Spyridon, to University of Utah, The. Catheter mounted artificial heart valve for implanting in close proximity to a defective natural heart valve. 3,671,979, Cl. 3-1.000.

Mount, Gordon L., to Carrier Corporation. Capacity control mechanism for centrifugal gas compressors. 3,672,786, Cl. 415-147.000.

Mross, Siegfried; Grossheim, Hans; and Aubert, Michel, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method and apparatus for compiling measured values of a variable parameter. 3,673,552, Cl. 340-3.00r.

Mueller, William N. Time saver drawup collar. 3,672,709, Cl. 285-419.000.

Muhlbach, Anton; and Lauckhardt, Gerhard, to USM Corporation. Method for rounding welded edge seams. 3,673,300, Cl. 264-160.000.

Mulaskey, Bernard F.; and Chilton, Elmore F., to Chevron Research Company. Catalyst manufacture. 3,673,079, Cl. 208-111.000.

Mulitz, Thomas C., to Pico Safe Stairs Co. Stair structure. 3,672,106, Cl. 52-188.000.

Muller, Karl, to Braun Aktiengeselischaft. Circuit arrangement for improving the signal-to-noise ratio of a stereo decoder. 3,673,342, Cl. 179-15.0bt.

Muller, Pierre, to Laboratories de L'Ozothine. Process for the accelerated obtaining of terpenic oxides using ultraviolet light. 3,673,066, Cl. 204-162.00r.

Muller, Rudolf: *See—*
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Muller, Willy: *See—*
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Muller, Willy; Wurm, Bruno; and Haag, Hermann, to Muller, Willy. Telephone answering devices. 3,673,332, Cl. 179-6.00e.

Multicraft, Incorporated: *See—*
Ramey, David S., 3,672,926.

Munson, Whitney K.; and Ricci, John N., said Ricci assor. to said Whitney. Staple remover housing means. 3,672,635, Cl. 254-28.

Murakami, Masakazo: *See—*
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Murakami, Noboru; and Hirozawa, Koichiro, to Aisin Seiki Kabushiki Kaisha. Fluid pressure control mechanism. 3,672,243, Cl. 74-753.000.

Murakami, Toshikazu: *See—*
Masuda, Yoshio; and Murakami, Toshikazu, 3,672,079.

Murcott, Charles E., to Lumex Inc. Invalid chair having adjustable headrest, seat, and footrest. 3,672,722, Cl. 297-437.000.

Murhpy, James A.; and Brown, Stirling Robert, to International Paper Company, mesne. Adhesively laminated cellulosic product. 3,672,950, Cl. 161-129.000.

Murphy, Declan S.; and Charest, Rolland C. H., to Atara Corporation. Quick release mechanism for sewage lagoon aeration guns. 3,672,647, Cl. 261-121.00r.

Murphy, James A.; and Brown, Stirling Robert, to International Paper Company, mesne. Adhesively laminated creped dinner napkin. 3,673,060, Cl. 161-126.000.

Murphy, Willard; and Beam, Norman A., to McGraw-Edison Company. Travel iron with folding handle. 3,672,080, Cl. 38-90.000.

Muryoi, Takeshi, to Nippon Kogaku K.K. Shiftable objective lens. 3,672,287, Cl. 95-64.00r.

Musch, Gordon F.: *See—*
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Awazu, Kenzo; Matsunaga, Kazu; Muto, Katsutoshi; Kai, Junjiro; and Oi, Kyoko, 3,673,103.

Mutter, William W., to Bulova Watch Company, Inc. Miniaturized battery-operated tuning-fork timepiece. 3,672,153, Cl. 58-23.0tf.

Nachtigall, Guenter Willi: *See—*
Rauch, Francis Clyde; and Nachtigall, Guenter Willi, 3,673,250.

Nadler, Martin L., to Du Pont de Nemours, E. I., and Company. Turf-like product and method of making it. 3,673,056, Cl. 161-62.000.

Nagahara, Yasumori: *See—*
Suzuki, Shigeru; Sugita, Keiji; and Nagahara, Yasumori, 3,672,762.

Nagata, Wataru; and Hayase, Yoshio, to Shionogi & Co., Ltd. 2-Hydrocarbyl aminovinyl phosphonates or phosphinates. 3,673,284, Cl. 260-944.000.

Nagin, Tony. Load, supporting chain and sprocket supporting structure therefor. 3,672,237, Cl. 74-89.210.

Naito, Daiji; and Ogawa, Shigeyoshi, to Daikin Kogyo Co., Ltd. Process for preparing fluorination catalyst. 3,673,113, Cl. 252-441.000.

Najera, Louis Martin: *See—*
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Nakagawa, Hisasi: *See—*
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Nakagawa, Kenichi: *See—*
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Nakai, Shoji; and Higuchi, Akio, to Kabushiki Kaisha Kamitsu Seisakusho. Detection arrangement of winding speed on a take-up winder. 3,672,589, Cl. 242-45.000.

Nakajima, Eizo: *See—*
Katsuyama, Shigeo; Asami, Atsumi; Watanabe, Masahide; Sato, Tsutomu; Norimatsu, Toshiaki; and Nakajima, Eizo, 3,672,819.

Nakamura, Tadahisa; Fujimoto, Hirozi; Yamamoto, akoto; and Shintomi, Yukito, to Fujisoku Electric Co., Ltd. Return mechanism for an automatically returning switch. 3,673,363, Cl. 200-153.00k.

Nakamura, Tadashi, to Ise Electronics Corporation. Cathode ray tubes having row and column electrodes attached to opposite sides of insulating substrate. 3,673,448, Cl. 313-86.000.

Nakamura, Takahiro: *See—*
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Nalco Chemical Company: *See—*

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Namiki, Kyoji: *See—*
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Nash, Alan Richard Brine. Dashpot including temperature-sensitive valve means. 3,672,475, Cl. 188-277.000.

Nasvytis, Algirdas L. Flywheel automotive vehicle. 3,672,244, Cl. 74-859.000.

Nathanson, Harvey C.; and Wickstrom, Robert A., to Westinghouse Electric Corporation. Conductor elements spaced from microelectronic component surface and methods of making the same. 3,672,985, Cl. 117-212.000.

National Cash Register Company: *See—*
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National Cash Register Company, The: *See—*
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National Distillers and Chemical Corporation: *See—*
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National Research Development Corporation: *See—*
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National Steel Corporation: *See—*
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Naumburg, Per; and Norrman, Jan Olof, to AB Centralsug. Silent valve. 3,672,630, Cl. 251-149.200.

Naya, Mikio; Yamaguchi, Haruki; and Horie, Izumi, to Minolta Camera Kabushiki Kaisha. Color thermometer. 3,672,217, Cl. 73-355.0em.

Nebe, Erich: *See—*
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Negrini, Maurice Anthony. Method of manufacturing plastic bowling pin. 3,672,031, Cl. 29-417.000.

Nelson, Lorne W. Multiple use sorting card. 3,672,499, Cl. 209-80.500.

Nelson, Raymond L., to Eastman Kodak Company. Motion detecting circuit. 3,673,496, Cl. 324-161.000.

Nelson, Robert: *See—*
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Nerwin, Hubert: *See—*
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Nerwin, Hubert, to Eastman Kodak Company. Photographic film unit. 3,672,273, Cl. 95-13.000.

Neth, Richard M.; Rogers, John M.; and Gallagher, James J., to Indian Head Inc. Apparatus for separating a web of lace into individual bands. 3,672,011, Cl. 28-1.0cs.

Neumann, Edward W.; and Borowski, Richard, to Loctite Corporation. Process for impregnating porous metal articles. 3,672,942, Cl. 117-62.200.

Neutra Cuatro S.A.: *See—*
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Neuzil, Francis E., Sr. Container implement for end loader vehicle. 3,672,724, Cl. 298-27.000.

New England Merchants National Bank, mesne: *See—*
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New York Toy Corporation: *See—*
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Newell, George F.; and Kennedy, Paul G., to Westinghouse Electric Corporation. Comparative display of images in color. 3,673,317, Cl. 178-5.20r.

Newman, Ritchey O., Jr.; and Schrenk, Walter J., to Dow Chemical Company, The. Laminate of a barrier layer enclosed in rigid high density polyolefin layers. 3,673,050, Cl. 161-165.000.

Newman, Yetty. Aquatic amusement device. 3,671,988, Cl. 9-349.000.

Newport, Richard A. Capping apparatus. 3,672,540, Cl. 221-63.000.

Neyendorf, Elvin E., to Lee, Raymond, Organization, Inc., The. Hanger for hose nozzle. 3,672,617, Cl. 248-75.000.

Nichols, William A.; and Simpson, Ralph E. Tape winding means. 3,672,592, Cl. 242-55.210.

Nicholson, John B., to Continental Can Company, Inc. Support for ham cans during double seaming. 3,672,318, Cl. 113-30.000.

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Niederer, Otto C. Egg stabilizer. 3,672,501, Cl. 209-121.000.

Niedrach, Leonard W.; and Stoddard, William H., Jr., to General Electric Company. Carbon dioxide sensor. 3,673,069, Cl. 204-195.00g.

Nief, Guy; and Morand, Jean-Pierre. Isotope separation apparatus. 3,673,406, Cl. 250-43.000.

Niehaus, Conrad F. Continuous metallurgical process. 3,672,869, Cl. 75-45.000.

Nielsen, Thomas C.: *See—*
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Nielsen, Waldemar R.; and Mathias, Charles D., to Industrial Tools, Inc. Helical blade milling cutter. 3,672,017, Cl. 29-105.000.

Niepmann, Otto, to Maschinenfabrik Fr. Niepmann & Co. Feeding device for cigarettes for cigarette packing machines. 3,672,541, Cl. 221-68.000.

Niezoldi & Kramer GmbH: *See—*
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Nihei, Seiji: *See—*
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Nihon Kagaku Kizai Kabushiki Kaisha: *See—*
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Niioka, Takeharu; and Hosokawa, Ryoji, to Tokyo Shibaura Electric Co., Ltd. Tape feed indicator device for a tape recorder. 3,673,351, Cl. 179-100.20r.

Nikoghossian, Albert-Jean. Dental implant. 3,672,058, Cl. 32-10.00a.

Nippon Electric Company Limited: *See—*
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Nippon Hatsujo Company, Limited: *See—*
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Nippon Hoso Kyokai: *See—*
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Nippon Kogaku K.K.: *See—*
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Nippondenso Kabushiki Kaisha: *See—*
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Nischk, Gunther: *See—*
Rinkler, Heinrich; Braden, Rudolf; and Nischk, Gunther, 3,673,242.

Nishida, Hideko; Yamaguchi, Kunihiko; Kumasaka, Noriyuki; Sugita, Yutaka; and Fujiwara, Hideo, to Hitachi, Ltd. Plated magnetic wire. 3,673,581, Cl. 340-174.0pw.

Nissan Motor Company, Limited: *See—*
Saitoh, Kohichi; Ohkubo, Nobuo; Sobajima, Katsunobu; and Hirano, Takeshi, 3,672,656.

Nisso Kinzoku Kabushiki Kaisha: *See—*
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Nixon, Glen E.: *See—*
Mc Coy, Michael R.; and Nixon, Glen E., 3,673,427.

Nixon, Joseph R., Jr., to Hercules Incorporated. Fractionation of inorganic acid-free cleavage reaction mixture. 3,672,961, Cl. 203-37.000.

Nobel, Fred I.; and Ostrow, Barnet D., to Lea-Ronal, Inc. Electrodeposition of gold and gold alloys. 3,672,969, Cl. 204-43.000.

Nobusawa, Tsukumo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Photocell controlled diaphragm. 3,672,753, Cl. 352-91.000.

Nodine, John H.: *See—*
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Noguchi, Junpei: *See—*
Ohkubo, Kinji; Noguchi, Junpei; and Ohmura, Kunioki, 3,672,901.

Noll, Stanley Darwin; and Delfeld, William F., to Production Experts, Inc. Downcoiler mandrel of the toggle link type for hot strip mills, and methods for repairing or rebuilding same. 3,672,030, Cl. 29-401.000.

Nomura, Yasuo: *See—*
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Nord-Aviation Societe Nationale de Constructions Aeronautiques: *See—*
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Nordson Corporation: *See—*
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Nordstrand, Leif Roland, to Kamas Kvarnmaskiner AB. Machine for separating a sheet from a sheet pile. 3,672,516, Cl. 214-8.50a.

Nordstrom, Per Christer. Building block. 3,672,110, Cl. 52-608.000.

Norimatsu, Toshiaki: *See—*
Katsuyama, Shigeo; Asami, Atsumi; Watanabe, Masahide; Sato, Tsutomu; Norimatsu, Toshiaki; and Nakajima, Eizo, 3,672,819.

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North American Door Corporation: *See—*
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North American Philips Corporation: *See—*
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North American Rockwell Corporation: *See—*
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Crowley, George C.; and Carlson, Gordon S., 3,673,381.
Northern Electric Company Limited: *See—*
Bastikar, Arvid Ramkrishnarao, 3,673,522.
Lougheed, James H., 3,673,391.
Zimmermann, Detlef; Campbell, David; and De Bortoli, George, 3,673,314.
Northern Fibre Products Company: *See—*
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Norton Abrasives Limited: *See—*
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Notelteirs, Victor Rosallie, to U.S. Philips Corporation. Electric incandescent lamp with an improved pinch seal. 3,673,454, Cl. 313-332.000.
Notz, Karl: *See—*
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Novo Terapeutisk Laboratorium A/S: *See—*
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Nuclear Associates, Inc.: *See—*
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Nuerrenbach, Axel: *See—*
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Nusbickel, Edward M., Jr.: *See—*
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Nye, John David, to Ferrox Iron Ltd. System for feeding grinding media to continuous attrition mill. 3,672,580, Cl. 241-79.000.
Obata, Shuichi: *See—*
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Oberai, Avtar S.: *See—*
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Oberhoff, Wolfgang: *See—*
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O'Brien, Thomas Edward, to Owens-Illinois, Inc. Low voltage pulser circuit for driving row-column conductor arrays of a gas discharge display capable of being made in integrated circuit form. 3,673,431, Cl. 307-241.000.
Oda, Fujio; and Obata, Shuichi, to Matsushita Electric Industrial Co., Ltd. Semiconductor stress transducer. 3,673,354, Cl. 179-100.41v.
Ogasawara, Sadanori, to Aikoku Kogyo Kabushiki Kaisha. Machine tool. 3,672,200, Cl. 72-285.000.
Ogawa, Hiroshi; Yamane, Sigeto; Nakagawa, Hisasi; and Uchida, Akinari, to Hitachi, Ltd. Electro-massager. 3,672,355, Cl. 128-36.000.
Ogawa, Masao: *See—*
Takahashi, Akira; Kojima, Hiroo; Ogawa, Masao; Osuka, Hiroshi; and Kobayashi, Shoichi, 3,673,279.
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Ohkubo, Kinji; Noguchi, Junpei; and Ohmura, Kunioki, to Fuji Photo Film Co., Ltd. Process of precipitating silver halide in the presence of a colloid and a water-soluble iron salt. 3,672,901, Cl. 96-94.000.
Ohkubo, Nobuo: *See—*
Saitoh, Kohichi; Ohkubo, Nobuo; Sobajima, Katsunobu; and Hirano, Takeshi, 3,672,656.
Ohmura, Kunioki: *See—*
Ohkubo, Kinji; Noguchi, Junpei; and Ohmura, Kunioki, 3,672,901.
Ohnishi, Shinji: *See—*
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Ohntrup, Frederick F.; and Pecsi, Louis E., to Eaton Yale & Towne, Inc. Photoelectric control for load handling device. 3,672,470, Cl. 187-1.000.
Oi, Kyoko: *See—*
Awazu, Kenzo; Matsunaga, Kazu; Muto, Katsutoshi; Kai, Junjiro; and Oi, Kyoko, 3,673,103.
Ojala, William K., to Ford Motor Company. System for controlling air and fuel temperature. 3,672,342, Cl. 123-122.00b.
Oji Paper Co., Ltd.: *See—*
Sakamoto, Junzo; Nozaki, Tadashi; Tsuji, Yoshifumi; and Shimada, Masaharu, 3,672,561.
Okada, Yosuke: *See—*
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O'Keeffe, Terence W.; and Morris, Jerome R., to Westinghouse Electric Corporation. Masked photocathode and method of making same. 3,672,987, Cl. 117-212.000.
Okuhara, Seiichi. Direction indicator for automobile. 3,673,565, Cl. 340-82.000.
Okumura, Kentaro: *See—*
Yoneda, Naoto; Ishihara, Teruo; Kobayashi, Tetsuji; Kondo, Yasuzo; Okumura, Kentaro; Kojima, Michio; and Nose, Takashi, 3,673,195.
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Olivares, Ismael A.: *See—*
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Olivetti, Ing. C., & C., S.p.A.: *See—*
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O'Loughlin, Bernard T.: *See—*
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O'Loughlin, James J.: *See—*
Vermillion, Herbert E.; and O'Loughlin, James J., 3,672,852.
Olsen, Perry Charles; and Tang, Pak Chong, to RCA Corporation. Video blanking and sound muting circuit. 3,673,318, Cl. 178-5.80r.
Olson, Gaylor G., to TRW Inc. Radiant energy beam scanning method and apparatus. 3,673,412, Cl. 250-201.000.
Olteanu, Bujor: *See—*
Georgescu, Eugenia; Gheja, Ion; Bugur, Victor; Zirna, Ion; Mazare, Theodora; Popescu, Elena-Lygia; Olteanu, Bujor; Marculescu, Nicolae; Filotti, Traian-Mircea; Barbul, Marius-Aurel; and Calin, Ion, 3,673,109.
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Omnionics, Inc.: *See—*
Gioia, Gaspare L.; Switzer, Norris H.; and Willerton, John K., 3,672,608.
O.M.P. Officine Meccanoplastiche Di Precisione S.R.L.: *See—*
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O'Neill, Thomas J.: *See—*
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Ono, Mitsuzo: *See—*
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Ono, Yoshiaki: *See—*
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Optisonics Corporation, mesne: *See—*
Gordon, Hershel; and McAdoo, Charles R., Jr., 3,673,346.
Orban, Jean: *See—*
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Orban, Nicholas: *See—*
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Organisation Ralfs KG: *See—*
Schneider, Erich, 3,672,487.
Organon Inc.: *See—*
De Jongh, Hendrik Paul, 3,673,225.
Oriani, Agostino, to Industrie Pereilli S.p.A., mesne. Distributing clamping stress device for cable laying. 3,672,613, Cl. 248-62.000.
Orlando, Charles M.; Wirth, Joseph G.; and Heath, Darrell R., to General Electric Company. 2,5-Bis(2-benzazolyl)hydroquinones and their derivatives. 3,673,202, Cl. 260-304.000.
Oronzio de Nora Impianti Elettrochimici S.p.A.: *See—*
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O'Rourke, John C.: *See—*
Arutunoff, Armais; and O'Rourke, John C., 3,672,795.
Ort, George M., to Dick, A. B., Company. Ferrocyanide-chelate conversion solution for electrophotographic offset masters. 3,672,885, Cl. 96-1.000.
Orthotron: *See—*
Girard, Jean Rene Marie, 3,673,462.
Osinga, Theo Jan: *See—*
Linsen, Bastiaan Gerardus; and Osinga, Theo Jan, 3,673,115.
Osoegawa, Hideru; and Kobayashi, Katuei, to Hitachi, Ltd. Semiconductor pellet fitted on a metal body. 3,673,478, Cl. 317-234.00r.
Ospelt, Gustav; and Kunkel, Wolfgang, to Gustav Ospelt Hovalwerk AG. Heating vessel. 3,672,337, Cl. 122-156.000.
Oster, Richard J.: *See—*
Gona, Donald J.; and Oster, Richard J., 3,672,293.
Ostermayer, Franz: *See—*
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Osuka, Hiroshi: *See—*
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Otake, Michio: *See—*
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Otis Elevator Company: *See—*
Yasuda, Kentaro, 3,672,214.
Ottaviano, John James. Alternatively occupant propelled or motor driven roundabout. 3,672,669, Cl. 272-33.00b.
Otto Bilz, Werkzeugfabrik: *See—*
Fauth, Otto, 3,672,692.
Otto, C., Dr., & Comp. G.m.b.H.: *See—*
Pries, Erich E. W., 3,672,519.
Overton, Harold L. Method and apparatus for forming a shale cake and measuring the resistivity and density thereof. 3,672,228, Cl. 73-432.00r.
Owens, Lowell D., to United States of America, Agriculture. Rhizobitoxine as a post-emergent herbicide. 3,672,862, Cl. 71-79.000.

Owens-Corning Fiberglas Corporation: *See—*
Benson, Gustav E.; and Pisani, James M., 3,672,148.
Marzocchi, Alfred, 3,673,150.
Pearson, Lee E., 3,673,028.
Stalego, Charles J., 3,672,857.
Owens-Illinois, Inc.: *See—*
Dietz, Raymond Louis, 3,673,092.
Johnson, William E.; and Schmersal, Larry J., 3,673,460.
Keller, Robert H., 3,672,860.
O'Brien, Thomas Edward, 3,673,431.
Pacak, Matthew, to Eaton Corporation. Automatic loading device for pulley splitting machine. 3,672,195, Cl. 72-71.000.
Pachmayr, Frank A., to Mershon Company. Reinforced pistol grip. 3,672,084, Cl. 42-71.00p.
Pahl, John G. Booster transformer switch. 3,673,360, Cl. 200-48.00r.
Pahlitzsch, Bruno. Method of and apparatus for manufacturing articles from blanks of sheet material. 3,672,667, Cl. 271-74.000.
Palazzolo, Mario, to DiMar Metal Fabricators, Inc. Device for preventing unauthorized removal of portable equipment. 3,672,190, Cl. 70-58.000.
Palluel, Auguste Louis Luciene, to Imperial Chemical Industries, Limited. Coating compositions. 3,673,137, Cl. 260-19.000.
Pamlenyi, George, to Carlson, Chesley F., Company. Photo process timer. 3,672,767, Cl. 355-37.000.
Panther Machine Corporation: *See—*
Grimm, Harold; and Zuckerman, Ira, 3,672,662.
Papa, Anthony Joseph; and Proops, William Robert, to Union Carbide Corporation. Non-punking phenolic foam. 3,673,130, Cl. 260-2.50f.
Papaioannou, Christos George, to American Cyanamid Company. Mixed anhydrides of N-aroyl-1-lower alkyl-5-nitro-2-imidazolecarboximidic acid and benzoic acids. 3,673,208, Cl. 260-309.000.
Paper Converting Machine Company, Inc.: *See—*
Small, Rudolph E.; Bradley, John J.; Sanders, Charles J.; and Slawny, Howard J., 3,673,052.
Paracchini, Mario: *See—*
Callieri, Michele; Faraci, Giorgio; and Paracchini, Mario, 3,672,147.
Paramore, Edwin L.; O'Loughlin, Bernard T.; and Brown, Thomas L., to Halliburton Company. Forming self-supporting barriers in mine passages and the like. 3,672,173, Cl. 61-36.000.
Parish, Hal G.: *See—*
Moore, Eugene R.; Bussey, Marlin G.; and Parish, Hal G., 3,672,951.
Parke, Harry G., to Galbraith-Pilot Marine Corporation. Loss of synchronism detector. 3,673,422, Cl. 307-87.000.
Parker, Earl E.; and Friedlander, Charles B., to PPG Industries, Inc. Foams formed by hardening emulsions of glycol in polyester resin. 3,673,132, Cl. 260-2.50n.
Parker, Harold F., to General Electric Company. Harmonic suppression circuit. 3,673,503, Cl. 328-167.000.
Parker, Vernon D.: *See—*
Seiber, James N.; and Parker, Vernon D., 3,673,190.
Parkhurst, George R., to University of California, The Regents of the. Automatic rock thinsectioning machine. 3,672,099, Cl. 51-3.000.
Parlagreco, Thomas J., to Lee, Raymond Organization, Inc., The. Hair-setting assist. 3,672,376, Cl. 132-9.000.
Parsen, Edward M. Cable gripping towing device. 3,672,636, Cl. 254-134.30r.
Paterson, Ross: *See—*
Ward, John; and Paterson, Ross, 3,673,420.
Patschan, Wolfgang: *See—*
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Patterson, Eldridge P.: *See—*
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Patterson, N. Donald: *See—*
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Patterson-Kelley Co., Inc., The: *See—*
Lowe, Leonard F., 3,672,444.
Paul Ferd. Peddinghaus: *See—*
Jagob, Karl, 3,672,660.
Pauliukonis, Richard S. Metering valve. 3,672,396, Cl. 137-512.000.
Paull, Henry, Jr. Filter apparatus and method. 3,672,507, Cl. 210-77.000.
Peacock, Peter J.: *See—*
Scarnato, Thomas J.; Tufts, Guy O.; Peacock, Peter J.; and Cicci, George B., 3,672,138.
Peacock, Peter J.; and Scarnato, Thomas J., to International Harvester Company. Roll opening device. 3,672,135, Cl. 56-14.200.
Peacock, Peter J.; and Gordon, Paul C., to International Harvester Company. Mower conditioner. 3,672,136, Cl. 56-14.4.
Pearce, James Gordon, to Stromberg-Carlson Corporation. Reverting call arrangement. 3,673,337, Cl. 179-17.00d.
Pearce, Ronald A., to Coors Container Company, mesne. Testing device for testing edges of cylinders for defects. 3,672,208, Cl. 73-49.200.
Pearl, David R.: *See—*
Gerber, Heinz Joseph; and Pearl, David R., 3,672,661.
Pearson, Lee E., to Owens-Corning Fiberglas Corporation. Glass fiber container and method of construction. 3,673,028, Cl. 156-172.000.
Pearson, Samuel Reader, to Texas Instruments, Incorporated. Resettable timing circuit. 3,673,439, Cl. 307-293.000.
Pecsi, Louis E.: *See—*
Ohntrup, Frederick F.; and Pecsi, Louis E., 3,672,470.
Pedigo, Joel B.: *See—*
Frampton, Orville D.; Pedigo, Joel B.; and Lecher, Hans Z., 3,673,251.
Peerless Chain Company: *See—*
Bambenek, Joseph B., 3,672,621.
Penick & Fred Limited: *See—*
Brouilliard, Robert E.; Coughlin, Leonard J.; and Winfrey, Vernon L., 3,672,922.
Penman, Melvin C. Fish cleaning and filleting device. 3,672,002, Cl. 17-69.
Pepmeier, Carl R.; Sincavage, Joseph T.; and Stoffregen, Louis E., to FMC Corporation. Apparatus for splicing sheet materials. 3,673,046, Cl. 156-517.000.
Perales, Fernand: *See—*
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Perkin-Elmer Corporation, The: *See—*
Major, Harold W., Jr., 3,673,404.
Perna, Aldo: *See—*
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Perrino, Thomas W.: *See—*
Macedo, Frank A.; and Perrino, Thomas W., 3,672,584.
Perry, Robert H.; and Matty, Thomas C., to Westinghouse Electric Corporation. Psuedo-and gate having failsafe qualities. 3,673,429, Cl. 307-218.000.
Pesante, Manlio, to RIV-SKF Officine di Villar Perosa S.p.A. Speed control device. 3,672,100, Cl. 51-165.770.
Peters, Allen A. Apparatus and method for launching and recovering a small boat. 3,671,986, Cl. 9-39.000.
Peters, Ignatius G., to United States of America, Air Force. Mixed field radiation dosimeter materials of amine salts of organic acids. 3,673,107, Cl. 252-408.000.
Petersen, Harro, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of 1,3,4-diazaphospholanes. 3,673,248, Cl. 260-543.0pn.
Peterson, Charles L., to Uarco Incorporated. Burster with interrupted drive. 3,672,551, Cl. 225-100.000.
Peterson, David D., to General Electric Company. Particle track etching method. 3,673,017, Cl. 156-7.000.
Peterson, William R., Jr.: *See—*
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Petit, Robert F.; and Wesnoskie, James F., to Teledyne, Inc., mesne. Work table having multiposition extension board. 3,672,312, Cl. 108-69.000.
Petrolite Corporation: *See—*
Mayse, Weldon D.; and Watson, Frederick D., 3,672,127.
Redmore, Derek, 3,673,196.
Watson, Frederick D.; and Winslow, Joseph D., Jr., 3,672,511.
Wiley, Robert A., 3,673,070.
Peyer, Siegfried: *See—*
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Pfenningsberg, Josef, to U.S. Textile Machine Company. Supply spindle for twisting machine. 3,672,145, Cl. 57-60.000.
Pfister, Horst: *See—*
Weissermel, Klaus; Uebe, Rudolf; and Pfister, Horst, 3,673,144.
Pfund, Adolf: *See—*
Berger, Leonard; Fitzpatrick, William E.; McGinley, James H.; Pfund, Adolf; and Schwartzberg, Ira G., 3,672,122.
Pharo, Wellington B.: *See—*
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Phegley, Wilbur H., 1/2 to Miller, Howard L. Safety hitch device. 3,672,702, Cl. 280-457.000.
Phelon, R. E., Company, Inc.: *See—*
Magrane, Robert T., 3,673,490.
Philco-Ford Corporation: *See—*
McDonough, Robert M., 3,673,540.
Phillips, James V. Magnetized recorder thread. 3,672,991, Cl. 117-235.000.
Phillips, Paul S., Jr.: *See—*
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Phillips Petroleum Company: *See—*
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Hill, Harold Wayne, Jr.; and Campbell, Robert W., 3,673,247.
Kinney, Alfred W.; and Williams, James W., 3,672,536.
Stacy, Galen D.; and Rohlfing, Raymond G., 3,672,070.
Trepka, William J., 3,673,166.
Phlieger, Graydon A., Jr., to United States of America, National Aeronautics and Space Administration. Pressurized lighting system. 3,673,424, Cl. 307-118.000.
Photocircuits; division of: *See—*
Zeblisky, Rudolph J., 3,672,923.
Photronic International Establishment: *See—*
Vital, Zoltan; and Orban, Jean, 3,673,485.
Pickett, Wiley J.; and Smith, Bynum E., to Utility Industries, Inc. Electrical junction for high-current conductors and connector and method suitable for making same. 3,673,313, Cl. 174-90.000.
Pickles, Joseph, to Ferro Manufacturing Corporation. Automobile door lock. 3,672,713, Cl. 292-216.000.
Pico Safe Stairs Co.: *See—*
Mulitz, Thomas C., 3,672,106.
Pieper, Don B., to Whim, Inc. Independent ignition engine. 3,672,164, Cl. 60-39.380.
Pieper, Kenneth M.; and Gibson, Thomas W., to Procter & Gamble Company, The. 3-Endo-methyl-3-exo(4'-methylpentanalyl)-2-

methylenebicyclo [2.2.1] heptane and process for preparing same. 3,673,256, Cl. 260-598.000.
Pierce, John H., to Bouligny, R. H., Inc. Traverse cam and follower for winders. 3,672,587, Cl. 242-43.000.
Pike, John W., to Struthers Scientific and International Corporation. Method of autoclaving building blocks. 3,672,009, Cl. 25-133.000.
Pilorusso, Felix. Teaching apparatus. 3,672,073, Cl. 35-34.000.
Pinot, Jean: *See—*
Fleury, Jean; and Pinot, Jean, 3,673,072.
Piringer, Fritz. Method and devices for the determination of colors and color tolerances in a visual manner in any kind of artificial light or sunlight. 3,672,780, Cl. 356-195.000.
Pirotta, Angelo, to Racing Tack di Angelo Pirotta & C.S.a.a. Harness for attaching a horse to a vehicle. 3,672,124, Cl. 54-38.000.
Pisani, James M.: *See—*
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Pitney Bowes-Alpex, Inc.: *See—*
Berler, Robert M., 3,673,416.
Pitney, Lennord L.: *See—*
Travor, Bruce W.; and Pitney, Lennord L., 3,672,254.
Planas, Luis Valls, to Neutra Cuatro S.A. Electronic high frequency pulse generator. 3,673,423, Cl. 307-107.000.
Plant Industries, Inc.: *See—*
Roper, William H.; Ross, Robert N.; and Visnovits, Gabor, 3,672,543.
Plaskett, Thomas S.: *See—*
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Platz, Rolf: *See—*
Merger, Franz; Platz, Rolf; and Nebe, Erich, 3,673,258.
Platzer, Emile W. Liquid cargo barge. 3,672,319, Cl. 114-74.00r.
Plichta, Michael J., to McGraw-Edison Company. Directional current relay. 3,673,425, Cl. 307-127.000.
Plumat, Emile; and Lelong, Jose, to Glaverbel S.A. Method and apparatus for surface coating articles. 3,673,006, Cl. 117-106.00r.
Plumb, Robert D. Archery bow string draw and release device. 3,672,346, Cl. 124-35.
Podebradsky, Everett V., to Mayer, Oscar, & Company, Inc. Method for the continuous manufacture of linked sausage products. 3,672,913, Cl. 99-109.000.
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Johnson, Bruce K., 3,672,275.
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Janich, Hans Jurgen, 3,672,502.
Pompey, Walter, to W-L Molding Company. Roller and retainer for a wire basket. 3,672,743, Cl. 312-352.000.
Popescu, Elena-Lygia: *See—*
Georgescu, Eugenia; Gheja, Ion; Bugur, Victor; Zirna, Ion; Mazare, Theodora; Popescu, Elena-Lygia; Olteanu, Bujor; Marculescu, Nicolae; Filotti, Traian-Mircea; Barbul, Marius-Aurel; and Calin, Ion, 3,673,109.
Popov, Boris Vasilievich; Slonim, Alexandr Zosimovich; Sonin, Anatoly Leonidovich; Zhukov, Gennady Konstantinovich; and Zhokhova, Olga Samuilovna. Straightening machine for pipe-like articles. 3,672,197, Cl. 72-79.000.
Porepp, Bernd. Apparatus for forming a plastic article. 3,672,805, Cl. 425-391.000.
Porter, H. K., Company, Inc.: *See—*
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Pospisil, Frantisek: *See—*
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Possick, Saul. Abdominal muscle exercise device. 3,672,356, Cl. 128-57.000.
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Potrafke, Werner. Device for self-service stores. 3,672,469, Cl. 186-1.00a.
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Prahl, Walter H.; and Lederman, Sol J., to Hooker Chemical Corporation. Crystallization of diphenylol alkanes. 3,673,262, Cl. 260-619.00a.
Pratt, Harold J., Jr.: *See—*
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Preusser, Gerhard; Schulze, Martin; and Richter, Klaus, to Koppers, Heinrich, Gesellschaft mit beschrankter Haftung. Process for separating saturated hydrocarbons and olefins. 3,673,081, Cl. 208-313.000.
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Prewett, Hubert P., Jr.; and Thompson, Charles H., to United States of America, Atomic Energy Commission. Automatic spindle growth compensation system. 3,672,246, Cl. 82-2.00b.
Price, Franklin Carr. Tuyere assembly. 3,672,648, Cl. 263-21.00a.
Price, John A.; and Stewart, Mary J., to FMC Corporation. Zinc and manganese gentisate as polyester catalysts and molecular weight enhancer. 3,673,157, Cl. 260-75.00r.
Pries, Erich E. W., to Otto, C., Dr., & Comp. G.m.b.H. Charging car for coke ovens. 3,672,519, Cl. 214-35.00r.
Prijn, Cornelis; and Benedetti, Franco, to U.S. Philips Corporation. Electric lamp comprising a lamp base of a synthetic material. 3,673,453, Cl. 313-318.000.
Primak, William L., to United States of America, Atomic Energy Commission. Automatic photoelastimeter. 3,672,772, Cl. 356-33.000.
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Prola, Victor J. Game device. 3,672,071, Cl. 35-9.00b.
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Ramiccio, Gerald S. Air-operated cutting device. 3,672,051, Cl. 30-123.00r.
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Rapisarda, Carmelo, to Du Pont de Nemours, E. I., and Company. Galvanic detection of oxygen in a spinning cell steam chamber. 3,672,800, Cl. 425-71.000.
Rasmussen, Ole-Bendt. Method for the production of synthetic sheet materials. 3,673,291, Cl. 264-46.000.
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Rathbone, Ivanhoe J., to Remo Precision Tools Limited. Annular shield for bearings. 3,672,736, Cl. 308-187.200.
Rauch, Francis Clyde; and Nachtigall, Guenter Willi, to American Cyanamid Company. Catalytic hydration of nitriles to produce amides. 3,673,250, Cl. 260-561.00n.
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Reader, Arthur M.; and Stackman, Robert W., to Celanese Corporation. Sulfobetaine glycol modified poly(ethylene terephthalate). 3,673,158, Cl. 260-75.
Reavis, Clifford L., Jr., to Interlectron Corporation, mesne. Method of making a laminated article comprising blood or skin tissue samples. 3,673,037, Cl. 156-280.000.
Red, David D. Structural column and construction. 3,672,711, Cl. 287-189.36r.
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Redemat S.A.: *See—*
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Reed, Donald L. Remote controlled football game with pass play apparatus. 3,672,674, Cl. 273-94.00r.
Reed, Gaylard O. Drive assembly for dual chuck veneer lathes. 3,672,416, Cl. 144-209.000.
Reed, Stanley E., Jr.; and Ruby, Donald C., to FMC Corporation. Injection pump. 3,672,794, Cl. 417-382.000.
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Reede, Thomas Pieter, to U.S. Philips Corporation. Use of a plurality of scanning directions for character center line determination. 3,673,566, Cl. 340-146.3ae.
Reefman, William E., to Bunker-Ramo Corporation, The. Electromechanical oscillator. 3,672,152, Cl. 58-23.00v.
Regan, John F., to Eaton Corporation. Security card. 3,672,191, Cl. 70-393.000.
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Fleury, Jean; and Pinot, Jean, 3,673,072.
Froumajou, Armand P., 3,672,698.
Reh, Lothar; Schmidt, Werner Hans; and Rosenthal, Karlheinz, to Metallgesellschaft Aktiengesellschaft. Fluidized-bed cooler and method of cooling particulate solid material. 3,672,069, Cl. 34-20.000.
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Reichelt, Walter; Ruthardt, Konrad; and Speidel, Hermann; deceased (by Speidel, Rosemarie Elisabeth, nee Rupprecht; Speidel, Helmuth; and Speidel, Dieter; heirs), to Heraeus, W. C., GmbH. Low current electrical contact comprising a layer of iron-nickel alloy and a layer of ruthenium. 3,672,850, Cl. 29-196.000.
Reid, James S., to Standard Products Company, The. Apparatus and method for aerating waste material. 3,673,082, Cl. 210-12.000.
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Reif, Robert B., to North American Rockwell Corporation. Ink mist suppression for a rotory printing press. 3,672,298, Cl. 101-350.000.
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Reni, Cesare; Lugo, Luigi; and Gualdi, Giorgio, to Societa' Italiana Resine S.p.A. Method of producing aromatic carboxylic acids from alkylbenzenes. 3,673,244, Cl. 260-524.00r.
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Richardson, Edwin A.; and Ueber, Russell C., to Shell Oil Company. Selectively reducing the permeability of a thief zone by electroless metal plating. 3,672,449, Cl. 166-292.000.
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Richins, Kenneth A., to Eaton Corporation, mesne. Vehicle with coordinated guiding and supporting mechanism. 3,672,307, Cl. 104-96.000.
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Riddle, Lavis Albert Henry; and Craig, Thomas, to British Hovercraft Corporation Limited. Flexible skirt assemblies for air cushion vehicles. 3,672,461, Cl. 180-127.000.

Riebs, Richard E., to McGraw-Edison Company. Apparatus and method for measuring electrical energy consumption. 3,673,495, Cl. 324-142.000.

Ried, John D., to Hamilton Company. Chromatograph inlet with rotating septum. 3,672,226, Cl. 73-422.0gc.

Riedel, Wolfgang, to Silma S.p.A. Film threading mechanism for use in motion picture projectors or the like. 3,672,754, Cl. 352-158.000.

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Riese, Hans-Walter; and Friedrich, Gerhard, to Fichtel & Sachs AG. Hydraulically operated wet-type friction clutch. 3,672,478, Cl. 192-86.000.

Riff, James A., to Motorola, Inc. Alternator and regulator control system. 3,673,489, Cl. 322-28.000.

Riff, James A., to Motorola, Inc. Voltage regulator indicating circuit for undervoltage, normal voltage and overvoltage conditions. 3,673,588, Cl. 340-248.00a.

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Ringwall, Carl G.; and Shah, Rasik P., to General Electric Company. Sensor and control system for controlling gas partial pressure. 3,672,388, Cl. 137-88.000.

Rinkler, Heinrich; Braden, Rudolf; and Nischk, Gunther, to Farbenfabriken Bayer Aktiengesellschaft. Sulfonic acid betaines. 3,673,242, Cl. 260-507.00r.

Rinse, Jacobus. Metal oxide acylates and their preparation. 3,673,229, Cl. 260-429.00r.

Riordan, Vincent P., to Microfibers, Inc. Flocked open looped pile fabric and method of making same. 3,672,929, Cl. 117-25.000.

Ritter, George F., Jr.; and Hymore, Frank J., to Libbey-Owens-Ford Company. Apparatus for tempering flat sheets or plates of glass. 3,672,861, Cl. 65-350.000.

Ritzerfeld, Gerhard. Punched tape controlled card puncher. 3,672,565, Cl. 234-36.000.

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Roach, Peter Francis; and Davidson, Daniel Fraser, to United Kingdom Atomic Energy Authority. Liquid metal monitors. 3,672,209, Cl. 73-61.01m.

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Robinder, Ronald C.; Rowe, William A.; and Schwartz, James W., to Zenith Radio Corporation. Process of manufacturing screens for shadow-mask tubes. 3,672,893, Cl. 96-36.100.

Robins, Ray Mervyn, to AMP Incorporated. Method of applying sleeves to electrical connectors. 3,673,299, Cl. 264-159.000.

Robinson, Peter John: *See—*
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Roblin, John M.; Cole, Frank J.; and Reed, William A., to Republic Steel Corporation. Vaporization of metal for vacuum metalizing. 3,672,327, Cl. 118-48.000.

Rocchi, Aldo, to Montecatini Edison S.p.A. Liquid dielectric composition of alkyl benzene and an antioxidation stabilizer. 3,673,093, Cl. 252-63.700.

Rocher, George; and Orban, Nicholas, to Metallurgical Exoproducts Corporation. Hot tops. 3,672,918, Cl. 106-38.220.

Rockwell, Adelbert W., Jr., to USM Corporation. Automatic actuating mechanism. 3,672,315, Cl. 112-219.000.

Roeder, Robert J., to Kimberly-Clark Corporation. Sanitary napkin with improved adhesive fastening means. 3,672,371, Cl. 128-290.00r.

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Rosen, Karl Isac Joe. Thread storage and delivery device for textile machines. 3,672,590, Cl. 242-47.120.

Rosenberg, David M.; and Manecke, Siegfried E., to Robertshaw Controls Company. Electrical switch having a snap blade means and method of calibrating the same or the like. 3,673,535, Cl. 337-347.000.

Rosenblum, Earl S., to United States of America, Army, mesne. Contrast photometer. 3,672,781, Cl. 356-201.000.

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Rosenwald, Robert H.; and Gaydasch, Alexander, to Universal Oil Products Company. Middle distillate. 3,672,854, Cl. 44-66.000.

Roser, Kenneth F. Sight glass for the inside inspection of pipes and cleaning of same. 3,672,749, Cl. 350-319.000.

Rosin, Jacob; and Ang, Frank S., to Chris-Craft Industries, Inc. Production of aromatic sulfones. 3,673,259, Cl. 260-607.

Ross, Dan C., to U.S. Dynamics Inc. Fiche camera with selective frame skip mechanism. 3,672,769, Cl. 355-40.000.

Ross, James W.: *See—*
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Ross, William C. Process of producing reinforced laminate. 3,673,023, Cl. 156-137.000.

Rosse, Thomas A.; and Blackmer, David E., to Instrumentation Laboratory, Inc. Fluid analyzing apparatus. 3,672,843, Cl. 23-253.00r.

Rosslein, Helmuth: *See—*
Krusche, Alfred; and Rosslein, Helmuth, 3,672,161.

Rous, Pierre. Pallet storage sectional frame structures. 3,672,515, Cl. 211-176.000.

Rousseau, Claude, to C.I.T.-Compagnie Industrielle des Telecommunications. Switching device for a double operation telegraphy subscriber. 3,673,316, Cl. 178-2.00r.

Rowe, William A.: *See—*
Robinder, Ronald C.; Rowe, William A.; and Schwartz, James W., 3,672,893.

Rowley, Douglas W.; and Campbell, John A., to Donaldson Company, Inc. Muffler for internal combustion engine. 3,672,464, Cl. 181-44.

Royster, Larry H., to Honeywell Inc. Control apparatus. 3,673,441, Cl. 310-8.600.

Roza, Abraham Gerrit Alexander, to Shell Oil Company. Process for producing electrode binder pitch and carbon black feedstock. 3,673,077, Cl. 208-76.000.

Rozanov, Vladimir Alexeevich: *See—*
Veroman, Viktor Jurievich; Rozanov, Vladimir Alexeevich; and Rabinovich, Mikhail Yakovlevich, 3,673,372.

Rubens, Louis C., to Dow Chemical Company, The. Process for preparing non-porous polymers from vinyl monomers. 3,673,131, Cl. 260-2.50r.

Rubenstein, Nathan. Centering fixture. 3,672,856, Cl. 51-237.000.

Rubin, Herbert, to New York Toy Corporation. Ball rebound device. 3,672,672, Cl. 273-26.00a.

Rubio, Manuel Jesus, to Barrera, Roberto Gonzalez. Tortilla and process using water soluble edible borate or aluminate. 3,672,912, Cl. 99-80.000.

Ruby, Donald C.: *See—*
Reed, Stanley E., Jr.; and Ruby, Donald C., 3,672,794.

Ruetschi, Paul, to Leclanche S.A. Antimagnetic alkaline miniature galvanic cell. 3,673,000, Cl. 136-107.000.

Ruhle, Emil T. Foam dispensing head. 3,672,546, Cl. 222-402.120.

Ruiz, Jose Antonio. Hinges that take to pieces. 3,671,998, Cl. 16-176.000.

Rundle, David F., to Bunker-Ramo Corporation, The. Miniature connector construction-adjustable, or floating. 3,673,545, Cl. 339-64.

Rupp, Hans-Dieter: *See—*
Meyer, Gerhard; Magerlein, Helmut; and Rupp, Hans-Dieter, 3,673,246.

Rush, Harold F., to Garren Corporation, mesne. Pipe jack. 3,672,705, Cl. 285-39.000.

Russell, Charles R.: *See—*
Buchanan, Russell A.; and Russell, Charles R., 3,673,136.

Russell, William G., to Electrohome Limited. Signal translating networks and control circuits for the tuners of signal receivers. 3,673,523, Cl. 334-15.000.

Russo, Baldassare, Jr.: *See—*
Russo, Carmela Mary; and Russo, Baldassare, Jr., 3,672,707.

Russo, Carmela Mary; and Russo, Baldassare, Jr. Expansion joint. 3,672,707, Cl. 285-229.000.

Rustad, Stanley C.: *See—*
Blixrud, John O.; Knigge, Wayne I.; Rustad, Stanley C.; and Tsuchiya, Takuzo, 3,672,294.

Ruthardt, Konrad: *See—*
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Ruti Machinery Works, Ltd.; formerly: *See—*
Strauss, Edgar H., 3,672,404.

Rutz, Hansrudolf; and Schmollinger, Tassilo, to Aktiengesellschaft Brown, Boveri & Cie. Dust seal for electric motors. 3,673,445, Cl. 310-88.000.

Ryan, Frederick M.: *See—*
Lehmann, Willi; and Ryan, Frederick M., 3,673,102.

Rygelis, Joseph; Sweet, Ervin J.; and Doyle, Brian W., to Avco Corporation. Combustion chamber assembly for a gas turbine engine. 3,672,162, Cl. 60-39.320.

Rynbrandt, Ronald H., to Upjohn Company, The. Exo-dibicycloalkane carboxamides. 3,673,197, Cl. 260-295.0am.

Sabatelli, Philip M.; and Brungs, Charles A., to Chemed Corporation. Detergent composition and process. 3,673,098, Cl. 252-156.000.

Sack, Werner, to Jenaer Glaswerk Schott & Gen. Sealing glass having high absorption of infrared radiation. 3,672,919, Cl. 106-52.000.

Sackinger, William M.; and Simms, Robert A., to Corning Glass Works. High gain storage target. 3,673,457, Cl. 315-12.000.

Sacks, Alvin H. Device for evacuating containers. 3,672,114, Cl. 53-88.000.

Safety Devices, Inc.: *See—*
Beck, Jacob C., 3,672,466.

Sagane, Norio; Kuwazuru, Issei; and Katesu, Isao, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Synthetic resin multicellular product whose main component is acrylonitrile and process for preparation thereof. 3,673,129, Cl. 260-2.50r.

Sagmuller, Joseph R.; and Hunter, Richard I., to Battelle Development Corporation, The. Slip casting. 3,672,882, Cl. 75-211.000.

Saint-Gobain Techniques Nouvelles: *See—*
Cherel, Guy H., 3,672,247.

Saito, Kazo: *See—*
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Saito, Nobuo; and Namiki, Kyoji, to Kabushiki Kaisha Tsuchiya Seisakusho. Fuel filter. 3,672,510, Cl. 210-438.000.

Saito, Takashi: *See—*
Inoue, Eiichi; Yamaji, Keizo; Tanaka, Hiroshi; and Saito, Takashi, 3,673,595.

Saitoh, Kohichi; Ohkubo, Nobuo; Sobajima, Katsunobu; and Hirano, Takeshi, to Nissan Motor Company, Limited and Nippon Hatsujo Company, Limited. Multi-leaf spring for automotive suspension. 3,672,656, Cl. 267-47.

Sakamoto, Junzo; Nozaki, Tadashi; Tsuji, Yoshifumi; and Shimada, Masaharu, to Oji Paper Co., Ltd., Daido Yoshiten Ltd. and Taiyo Kogyo Company Limited. Dispensing container. 3,672,561, Cl. 229-51.00d.

Sakamoto, Yuzaburo; and Toyooka, Morio, to Hitachi, Ltd. Method for bonding a conductive wire to a metal electrode. 3,672,047, Cl. 29-628.000.

Sakumoto, Hideki: *See—*
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Salloum, Charles R. Rotary vehicle parking system with ramp and turntable arrangement. 3,672,517, Cl. 214-16.10a.

Salmon, Leonard M. Rotary pump and power transmission system. 3,672,168, Cl. 60-53.00r.

Salopian Industries Metals Limited: *See—*
Walters, Anthony George, 3,672,485.

Salzer, Erwin, to Chase-Shawmut Company, The. Electric low-voltage fuse having terminal bars. 3,673,533, Cl. 337-161.000.

Sampson, Robert W.: *See—*
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Sanders, Charles J.: *See—*
Small, Rudolph E.; Bradley, John J.; Sanders, Charles J.; and Slawny, Howard J., 3,673,052.

Sanders, Dickerson H. Method and apparatus for gathering and confining live poultry. 3,672,335, Cl. 119-82.000.

Sandoz Ltd.: *See—*
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Sandviken Jernverks Aktiebolag: *See—*
Carlen, Jan-Christer Henric Ovesson; and Bergqvist, Claes Bertil, 3,672,877.

Santirocco, Louis J.; Rose, Duane L.; and Scofield, John W., to United States of America, Commerce, mesne. Reversible, bypassable aperture card reader. 3,672,664, Cl. 271-3.000.

Santry, George J.; and Wecenske, Harold R., to Corning Glass Works. Gripping and sealing system for slab facing materials. 3,672,107, Cl. 52-235.000.

Sargent-Welch Scientific Company: *See—*
Trcka, Ronald; and Sherrick, Paul H., 3,672,838.

Sasaki, Tadajiro, to Kabushiki Kaisha Sasakiseisakusho. Process and apparatus for automatic cutting and piling of knitted fabrics. 3,672,249, Cl. 83-80.000.

Sato, Akira; Ueda, Hirozo; and Ono, Yoshiaki, to Fuji Photo Film Co., Ltd. Silver halide color photographic light sensitive material. 3,672,897, Cl. 96-74.000.

Sato, Kazuo: *See—*
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Sato, Kogo; Kato, Hiroshi; and Ohnishi, Shinji, to Hitachi, Ltd. Method of forming the electrode of a semiconductor device. 3,672,984, Cl. 117-212.000.

Sato, Masamichi: *See—*
Matsumoto, Seiji; Tamai Yasuo; Takimoto, Masaaki; and Sato, Masamichi, 3,672,887.

Sato, Masamichi; and Takahashi, Isoji, to Fuji Photo Film Co., Ltd. Apparatus for developing a latent electrostatic image. 3,672,330, Cl. 118-637.000.

Sato, Tsutomu: *See—*
Katsuyama, Shigeo; Asami, Atsumi; Watanabe, Masahide; Sato, Tsutomu; Norimatsu, Toshiaki; and Nakajima, Eizo, 3,672,819.

Sato, Yoshio, to Kabushiki Kaisha Ideal. Automatically openable and closable umbrella. 3,672,382, Cl. 135-24.000.

Saunders, Frank L.; and Sheetz, David P., to Dow Chemical Company, The. Preparation of stable latexes from ethylenically unsaturated polymerizable water isoluble polymer of an ethylenically insoluble compound. 3,673,142, Cl. 260-29.6rw.

Savageau, Robert George: *See—*
Ackerman, Joseph Francis; Weisfeld, Joseph; Savageau, Robert George; and Beerli, George, 3,673,140.

Saveth, Ivan H., to Thermoformed Plastics Corporation. Cover for spool. 3,672,598, Cl. 242-118.200.

Sawhill, Duane L., to Olin Corporation. Sodium phosphate recovery process. 3,672,827, Cl. 23-107.000.

Sawyer, Roy D.; and Tinsley, John D., to Nalco Chemical Company. Sewage treatment. 3,673,083, Cl. 210-18.000.

Sayigh, Adnan A. R.: *See—*
Hayash, Edward F., Jr.; Reymore, Harold E., Jr.; and Sayigh, Adnan A. R., 3,673,128.

Sayles, James Norman. Drain plug. 3,671,982, Cl. 4-295.000.

Sayre, Jack L., to United States of America, Navy. Claw arms with swivel plate. 3,672,717, Cl. 294-104.000.

Scarbrough, Don R.; and Vilagi, Burton J., to Nordson Corporation. Sequence control of color change. 3,672,570, Cl. 239-70.000.

Scarnato, Thomas J.: *See—*
Peacock, Peter J.; and Scarnato, Thomas J., 3,672,135.

Scarnato, Thomas J.; and Patterson, N. Donald, to International Harvester Company. Push over bar. 3,672,132, Cl. 56-1.000.

Scarnato, Thomas J.; Tufts, Guy O.; Peacock, Peter J.; and Cicci, George B., to International Harvester Company. Forage harvester. 3,672,138, Cl. 56-158.000.

Schadow, Rudolf. Slide key switch with improved plunger actuating mechanism with lost motion coupling. 3,673,365, Cl. 200-16.00r.

Schadt, Karl-Heinz: *See—*
Scheibel, Josef; and Schadt, Karl-Heinz, 3,672,268.

Schaedler, Alvin C. Fork lift apparatus. 3,672,525, Cl. 214-674.000.

Schaefer, Bruce M., to Singer Company, The, mesne. Circuit tester. 3,673,397, Cl. 235-153.000.

Schaefer, Donald L., to General Electric Company. Method of forming group III-V compound photomitters having a high quantum efficiency and long wavelength response. 3,672,992, Cl. 117-219.000.

Schafer, Horst, to Semikron Gesellschaft fur Gleichrichterbau und Elektronik m.b.H. Semiconductor rectifying arrangement. 3,673,468, Cl. 317-234.000.

Scharpf, Lewis G., Jr., to Monsanto Company. Germination of spores. 3,672,956, Cl. 195-96.000.

Scharpf, Lewis G., Jr., to Monsanto Company. Germination of spores. 3,672,957, Cl. 195-96.000.

Schaub, Heiner; Thaddey, Kurt; and Celio, Tino, to Ciba-Geigy AG. Apparatus for making prints from colour negatives. 3,672,768, Cl. 355-38.000.

Scheckel, Konrad, to Heetmann & Finkensiep KG. Apparatus for forming retaining members. 3,672,410, Cl. 140-103.000.

Scheibel, Josef; and Schadt, Karl-Heinz, to Niezoldi & Kramer GmbH. Photographic apparatus for use in daylight and artificial light. 3,672,268, Cl. 95-10.0ce.

Scheinpflug, Hans: *See—*
Daum, Werner; Scheinpflug, Hans; Frohberger, Paul-Ernst; and Grewe, Ferdinand, 3,673,210.

Scheppele, Lyle W., to Toledo Stamping & Manufacturing Co. Apparatus for distributing animal feed. 3,672,334, Cl. 119-52.00b.

Scherenberg, Hans O., to Daimler-Benz Aktiengesellschaft. Radial sealing bar for pistons of rotary piston internal combustion engines. 3,672,798, Cl. 418-113.000.

Schering Corporation: *See—*
Shapiro, Elliot L., 3,673,223.

Schiess, George: *See—*
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Schiller, Teddy M., to Purex Corporation. Presser tool with faulty operation lock. 3,672,193, Cl. 72-4.000.

Schleicher, Lowell: *See—*
Horst, William R.; and Schleicher, Lowell, 3,673,597.

Schleyer, Paul von R., to Union Carbide Corporation. Hexacyclotetracdecanes. 3,673,268, Cl. 260-666.0py.

Schlinger, Warren G.; and Kaufman, Harold C., to Texaco Inc. Manufacture of petroleum coke. 3,673,080, Cl. 208-131.000.

Schloemann Aktiengesellschaft: *See—*
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Schlumberger Technology Corporation: *See—*
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Schlunke, Jurgen: *See—*
Junk, Dieter; Schlunke, Jurgen; and Boixen, Heinz, 3,672,018.

Schlussler, Hans-Joachim, to Henkel & Cie G.m.b.H. Inhibitor for aluminium in alkaline solutions. 3,672,821, Cl. 21-2.700.

Schlutz, Charles A.; and Bellamy, David, Jr., to Baxter Laboratories, Inc. Rotary fluid seal and distribution means for centrifuges. 3,672,564, Cl. 233-26.000.

Schmersal, Larry J.: *See—*
Johnson, William E.; and Schmersal, Larry J., 3,673,460.

Schmidt, Ernst, to Firestone Tire & Rubber Company, The. Synthetic latex foam rubber and method of making same. 3,673,133, Cl. 260-2.50l.

Schmidt, Werner Hans: *See—*
Reh, Lothar; Schmidt, Werner Hans; and Rosenthal, Karlheinz, 3,672,069.

Schmitt, Karl; Gude, Fritz; and Brandt, Siegfried, to Scholven-Chemie Aktiengesellschaft. Plastic of polyamide and epoxy resin. 3,673,273, Cl. 260-830.00p.

Schmitt, Karl; Guda, Fritz; and Brandt, Siegfried, to Scholven-Chemie Aktiengesellschaft. Thermosetting resin of polyamide and copolymer of polycarboxylic acid and an olefin. 3,673,277, Cl. 260-857.0un.

Schmitz, Rudolf: *See—*
Baier, Franz; and Schmitz, Rudolf, 3,673,045.

Schmollinger, Tassilo: *See—*
Rutz, Hansrudolf; and Schmollinger, Tassilo, 3,673,445.

Schnall, Gunther: *See—*
Hartwig, Karl; Engel, Herbert; and Schnall, Gunther, 3,672,764.

Schnall, Gunther; and Engel, Herbert, to Agfa-Gevaert Aktiengesellschaft. Device for the feeding of sheets in copying machines or the like. 3,672,665, Cl. 271-39.000.

Schneble, Frederick W., Jr.; McCormack, John F.; Zeblisky, Rudolph J.; Williamson, John Duff; and Polichette, Joseph, to Day Company, N.V. Metallization of insulating substrates. 3,672,986, Cl. 117-212.000.

Schnedler, Paul E., to Armco Steel Corporation. Releasable melting means for movable fluid nozzle extension. 3,672,324, Cl. 118-63.000.

Schneider, Erich, to Organisation Ralfs KG. Vertical conveyors. 3,672,487, Cl. 198-165.000.

Schneider, Irwin. Method of information storage using electro-optic properties of color centers in alkali halide crystals. 3,673,578, Cl. 340-173.0cc.

Schneider, Jos., & Co. Optische Werke: *See—*
Hess, Karl Gunter, 3,673,483.

Schober, Thomas G., to Houdaille Industries, Inc. Turret indexing control circuit. 3,673,393, Cl. 235-151.100.

Schoenmakers, Johannes Joseph Martinus, to U.S. Philips Corporation. High-frequency recordings device. 3,673,347, Cl. 179-100.20t.

Schoeps, Knut Christian, to Atlas Copco Aktiebolag. Impulse motor. 3,672,185, Cl. 64-26.000.

Scholven-Chemie Aktiengesellschaft: *See—*
Schmitt, Karl; Gude, Fritz; and Brandt, Siegfried, 3,673,273.
Schmitt, Karl; Guda, Fritz; and Brandt, Siegfried, 3,673,277.

Schraeder, Albin E., to Jones & Laughlin Steel Corporation. Measurement of temperature of a moving strand in a vacuum. 3,672,216, Cl. 73-343.00r.

Schramm, Geza; and Riedl, Horst, to Osterreichische Stickstoffwerke Aktiengesellschaft. Preparation of piperidyl-steroids. 3,673,175, Cl. 260-239.500.

Schrenk, Walter J.: *See—*
Newman, Ritchey O., Jr.; and Schrenk, Walter J., 3,673,050.

Schroeder, Arthur F.: *See—*
Buth, Roy C.; and Schroeder, Arthur F., 3,673,047.

Schroeder, Duane Arthur; Weiss, Alvin Dennis; and Giltner, Benedict Clare, to Methode Development Company. Electrical resistant material. 3,673,117, Cl. 252-512.000.

Schroen, Walter H.: *See—*
Pritchard, John P., Jr.; and Schroen, Walter H., 3,673,071.

Schroeter, Siegfried H., to General Electric Company. Alkoxyoxetanes. 3,673,216, Cl. 260-333.000.

Schromm, Kurt; Mentrup, Anton; Zeile, Karl; Renth, Ernst-Otto; Engelhardt, Albrecht; and Traunecker, Werner, to Boehringer Ingelheim G.m.b.H. Bis-(dihydroxyphenyl-ethylol) alkylenediamines and the salts thereof. 3,673,187, Cl. 260-253.000.

Schulte, Friedrich Wilhelm; Diels, Manfred; and Rosenkranz, Wilhelm, to Fuchs, Otto. Method of making wheels. 3,672,021, Cl. 29-159.010.

Schultz, Jerald, to Eaton Corporation. Mortise lock with multiple functions. 3,672,714, Cl. 292-34.000.

Schulz, Gerald L.; and Mansur, Raymond T., to United States of America, Army. Heat sealer. 3,673,041, Cl. 156-306.000.

Schulze, John J., to Addressograph-Multigraph Corporation. Method and apparatus for applying liquid developer to copy sheets. 3,672,326, Cl. 118-8.

Schulze, Martin: *See—*
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Schulze-Robbecke, Hans; and Tiedtke, Alfred, to Riloga-Werk Julius Schmidt. Curtain suspension devices with an electric motor drive. 3,672,425, Cl. 160-331.000.

Schuster, Frank. Cleaning device. 3,672,380, Cl. 134-172.000.

Schuster, John D. Lubricating idler for roller chains or the like. 3,672,468, Cl. 184-15.00a.

Schutt, Hans U., to Shell Oil Company. Hydrocracking catalyst activation treatment. 3,673,108, Cl. 252-411.00r.

Schutte, Harlan H.: *See—*
Triolo, Peter T.; and Schutte, Harlan H., 3,672,806.

Schwan, Judith A.; and Graham, James L., to Eastman Kodak Company. Multicolor silver halide photographic materials and processes. 3,672,898, Cl. 96-74.000.

Schwartz, Hermann, to Peyer, Siegfried. Yarn defect detector apparatus for textile machinery. 3,673,591, Cl. 340-259.000.

Schwartz, James W.: *See—*
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Schwartz, Robert J., to Schlumberger Technology Corporation. Pulse resolution system. 3,673,559, Cl. 340-18.000.

Schwartzberg, Ira G.: *See—*
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Schwarz, Gerhard. Photographic camera. 3,672,284, Cl. 95-42.000.

Schwarz, Karl: *See—*
Van Stappen, Albert Louis; and Schwarz, Karl, 3,672,902.

Schwarz, Lothar. Syringe. 3,672,368, Cl. 128-218.00n.

Schwarzkopf, August, to Windmoller & Holscher Westphalia. Apparatus for stacking flattened bags of thermoplastic material which are made in a bag-making machine. 3,672,265, Cl. 93-93.0dp.

Schweizerische Industrie-Gesellschaft: *See—*
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Schwerdtel, Wulf: *See—*
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Schwertfeger, Owen J.; and Brill, Frank D., to Seeburg Corporation of Delaware, The. Apparatus for providing a predetermined volume of liquid. 3,672,479, Cl. 194-13.000.

Scislowicz, Henry M., to Abbott Laboratories. Retaining clip for catheter sheath. 3,672,367, Cl. 128-214.4.

Scofield, John W.: *See—*
Santirocco, Louis J.; Rose, Duane L.; and Scofield, John W., 3,672,664.

Scott, Donald R.: *See—*
Singh, Kanwal N.; Cremean, Stephen P.; and Scott, Donald R., 3,672,442.

Scott, Douglas R., to Robertshaw Controls Company. Pneumatically operated valve means and fuel control system utilizing the same. 3,672,400, Cl. 137-630.220.

Scott, Douglas R., to Robertshaw Controls Company. Pneumatic control system and parts therefor or the like. 3,672,792, Cl. 417-306.000.

Scovill Manufacturing Company: *See—*
Triolo, Peter T.; and Schutte, Harlan H., 3,672,806.
Weber, Robert L., 3,672,354.

Scribner, Richard M., to Du Pont de Nemours, E. I., and Company. C-21 lower alkylsulfinyl esters of certain 21-hydroxycorticosteroids. 3,673,179, Cl. 260-239.550.

Sebenda, Jan; and Puffr, Rudolf. Preparation of polymers of lactams with reduced crystallinity. 3,673,161, Cl. 260-78.

Seeburg Corporation of Delaware, The: *See—*
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Seegmiller, Wan: *See—*
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Segar, William R., to Westinghouse Electric Corporation. Roadway switching arrangement for transportation system having center guiderail below track level. 3,672,308, Cl. 104-246.000.

Seiber, James N.; and Parker, Vernon D., to Dow Chemical Company, The. Chlorinated pyridylacetylene compounds. 3,673,190, Cl. 260-290.0hl.

Seibert, Gerhard; and Gerlach, Klaus, to Glanzstoff AG. Process for the production of an artificial leather and the resultant product. 3,672,943, Cl. 117-63.000.

Seipel, Hans J.; Gancarz, Walter F.; and Aves, Donald J. Vacuum-system cleaning circulation device. 3,672,379, Cl. 134-168.00r.

Seki, Susumu, to Hitachi, Ltd. Numerically controlled contouring system. 3,673,396, Cl. 235-151.11.

Sekiguchi, Hideto: *See—*
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Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
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Seko, Maomi; Yomiyama, Akira; Miyake, Tetsuya; and Iwashita, Hidemaro, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for recovering waste acids and metals by electrodialysis. 3,673,068, Cl. 204-180.00p.

Selas Corporation: *See—*
Esselink, Abraham J., 3,672,847.

Selin, Terry G.: *See—*
Holub, Fred F.; Berger, Abe; and Selin, Terry G., 3,673,155.

Selleck, Robert W.; and Allen, Philip H., to Cycle Equipment Company. Reel. 3,672,594, Cl. 242-71.800.

Sells, Russell E. Fishing sinker. 3,672,088, Cl. 43-44.970.

Selman, Gordon Leslie: *See—*
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Semikron Gesellschaft fur Gleichrichterbau und Elektronik m.b.H.: *See—*
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Senge, Gerd; and Sieburg, Rolf, to Reidel & Co., Firma. Bright-zinc plating bath. 3,672,971, Cl. 204-55.00r.

Sengoku, Koji: *See—*
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Shah, Rasik P.: *See—*
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Shando, Joseph G.: *See—*
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Shapiro, Eliiot L., to Schering Corporation. 6-Thiocyanato-16-methylene-4, 6-pregnadienes, methods for their manufacture, and intermediates thereof. 3,673,223, Cl. 260-397.400.

Shapiro, Harris J.: *See—*
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Sharp Kabushiki Kaisha: *See—*
Tagawa, Takao, 3,673,599.

Shaw, Donald N., to United States of America, Army. Electronic digital accelerometer, fuze, or safety and arming mechanism. 3,672,302, Cl. 102-70.20r.

Shcurr, Harry W., II, to United States Steel Corporation. Apparatus for manipulating an oxygen injection lance. 3,672,652, Cl. 266-34.0lm.

Sheckler, Addison C. Bean harvester. 3,672,451, Cl. 171-58.000.

Sheer, Samuel Irving, to North American Door Corporation. Package for factory-assembled overhead door. 3,672,492, Cl. 206-46.00h.

Sheetz, David P.: *See—*
Saunders, Frank L.; and Sheetz, David P., 3,673,142.

Sheld, Clarence A., to Bausch & Lomb, Incorporated. Laminated transparent bodies having mar resistant protective coatings. 3,673,055, Cl. 161-183.000.

Shell Oil Company: *See—*
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Morris, Rupert C.; and Mason, Ronald F., 3,673,231.
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Simons, Peter, to Farbenfabriken Bayer Aktiengesellschaft. Process for the production of aminoguanidine bicarbonate. 3,673,253, Cl. 260-564.00f.

Simpson, Elsworth C., to Polylok Corporation. Fabric. 3,672,187, Cl. 66-192.000.

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Sipos, Donald J.; Steigerwald, Robert F.; and Whitcomb, Newell E., to Du Pont de Nemours, E. I., and Company. Ductile corrosion-resistant ferrous alloys containing chromium. 3,672,876, Cl. 75-124.000.

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Smedstad, Seth Morris. Swab tool for test tubes. 3,671,993, Cl. 15-211.000.

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Smith, George Armstrong; and MacLeod, Donald Simon, to New Nchanga Consolidated Copper Mines Limited. Electrowinning of metal. 3,673,062, Cl. 204-112.000.

Smith, Gordon Victor; and Ward, Eric John, to Sparcatron Limited. Gap-monitoring electric-discharge-machining apparatus. 3,673,371, Cl. 219-69.00g.

Smith, Horace L., Jr., to Smitherm Industries, Inc. Method for producing soluble coffee concentrates. 3,672,911, Cl. 99-71.000.

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Smith, Noyes D., Jr., to Shell Oil Company. Discontinuous coherent wave acoustic holography. 3,673,557, Cl. 340-15.05h.

Smith, Richard D.; and Furlong, Dale A., to Combustion Power Company, Inc. Air pollution-free internal combustion engine and method for operating same. 3,672,341, Cl. 123-119.00e.

Smith, Richard Deming, to RCA Corporation. Computer with program tracing facility. 3,673,573, Cl. 340-172.5.

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Societe Grenobloise d'Etudes et d'Applications Hydrauliques (Sogreah): *See—*
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Sollott, Gilbert P.; and Peterson, William R., Jr., to United States of America, Army. Explosive pyrotechnic complexes of ferrocene and inorganic nitrates. 3,673,015, Cl. 149-29.000.

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Sonderegger, Hans Conrad. Temperature compensated piezoelectric accelerometer. 3,673,442, Cl. 310-8.400.

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Sonius, Wesley Allan. Headlights with safety relay control. 3,673,456, Cl. 315-83.000.

Sonntag, William B. Animal trap. 3,672,090, Cl. 43-66.000.

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Goldfarb, Adolph E.; and Soriano, Rene, 3,672,676.

Sorteberg, Johannes. Non-bleed pilot valve. 3,672,629, Cl. 251-61.200.

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Spanos, William M., to International Telephone and Telegraph Corporation. Continuous phase shifter/resolver employing a rotary half-wave plate. 3,673,516, Cl. 333-5.000.

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Speidel, Helmuth: *See—*
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Speidel, Rosemarie Elisabeth, nee Rupprecht: *See—*
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Spicer, Larry Dean; and Hand, John James, to American Cyanamid Company. 6-m-Amino and substituted-amino phenyl-2,3,5,6-tetrahydro 2,3,5,6-tetrahydro [R 2 SP SQUARE RGT]2,1-b[R thiazoles and method of use. 3,673,205, Cl. 260-306.700.

Spiller, Lester L.; and Smith, Stephen J., to Ransburg Electro-Coating Corporation. Electrostatic coating method. 3,672,927, Cl. 117-17.000.

Spiller, William H., to General Electric Company. Rotating alternator current generator system. 3,673,488, Cl. 322-28.000.

Spindelberger, Franz, to Heiss-Thurow, E. Control mechanism for alternately applying a pressure medium upon the opposite lateral sides of a rotary piston. 3,672,258, Cl. 91-355.000.

Spokes, Raymond E.: *See—*
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Stalego, Charles J., to Owens-Corning Fiberglas Corporation. Apparatus for producing glass filaments with auxiliary heating means. 3,672,857, Cl. 65-12.000.

Standard Products Company, The: *See—*
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Stanford Research Institute: *See—*
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Stanley, Brian. Electronic relay. 3,673,435, Cl. 307-257.000.

Stanley, William L., to United States of America, Agriculture. Preparation of an insoluble active enzyme. 3,672,955, Cl. 195-68.000.

Stanray Corporation, mesne: *See—*
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Starr, Carrol Dean; and Wang, Teh Po, to Driver, Wilbur B., Company. Thermocouple for nuclear environment. 3,673,003, Cl. 136-236.000.

Starr, Ralph W. Article sampling apparatus. 3,672,224, Cl. 73-421.00r.

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Steigerwald, Robert F.: *See—*
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Steinberg, Adalberto; and Ricco, Silvio. Slider buckle for straps and the like. 3,672,007, Cl. 24-196.000.

Steinberg, David Herbert, to Ciba-Geigy Corporation. Alkylhyclroxyphenyl thioalkanonate stabilizers for organic materials. 3,673,151, Cl. 260-45.85.

Stelts, Philip D.; and Kern, David W., to Bethlehem Steel Corporation. Instrument lance for basic oxygen steelmaking furnace. 3,672,222, Cl. 73-343.00r.

Stephansen, Erik W., to Bechtel International Corporation. Microwave drying apparatus. 3,672,066, Cl. 34-1.000.

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Stout, Beauford F.; and Hann, George W., to Worth Well Surveys, Inc. Apparatus employing diode junction means for measuring subterranean temperatures. 3,672,215, Cl. 73-154.000.

Stowasser, William F.; and Miller, Keith A., to Air Products and Chemicals, Inc. Water cooling method and apparatus employing liquid nitrogen. 3,672,182, Cl. 62-98.000.

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Strauss, Edgar H., to Ruti Machinery Works, Ltd.; formerly and Caspar Honegger. Device for producing thread windings on a loom. 3,672,404, Cl. 139-12.000.

Streb, Alan J.: *See—*
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Strope, Douglas H.; and Wilson, Alan D., to International Business Machines Corporation. Holographic system and process utilizing a wet cell phase hologram. 3,672,744, Cl. 350-3.500.

Strople, Gordon N.; and Mills, Justin W., Jr., to Lif-O-Gen, Inc. Apparatus for dispensing sterile gas. 3,672,129, Cl. 55-270.000.

Strull, Gene, to Westinghouse Electric Corporation. Process for producing a cesium coated gallium arsenide photocathode. 3,673,011, Cl. 148-175.000.

Struthers Energy Systems, Inc.: *See—*
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Struthers Scientific and International Corporation: *See—*
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Stull, James T.: *See—*
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Sugita, Keiji: *See—*
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Sugita, Yutaka: *See—*
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Sugiyama, Kimroku: *See—*
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Sullivan, Bruce M.; and Kaus, Carl M., to Donaldson Company, Inc. Retention means for air cleaner element. 3,672,130, Cl. 55-323.000.

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Sumitomo Chemical Company, Ltd.: *See—*
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Summers, George D. Implantable bio-data monitoring method and apparatus. 3,672,352, Cl. 128-2.00r.

Sun Oil Company: *See—*
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Sundin, A. E., Produkter AB: *See—*
Sundin, Anders Erik, 3,672,159.

Sundin, Anders Erik, to Sundin, A. E., Produkter AB. Apparatus for crane jibs adapted to be extended and retracted telescopically. 3,672,159, Cl. 60-10.500.

Sundstrand Data Control Incorporated, mesne: *See—*
Siegel, Vernon H., 3,673,443.

Suntop, Morris A.; and Randmere, Uno, to Stromberg-Carlson Corporation. Two-party automatic number identification in subscriber carrier telephone system. 3,673,330, Cl. 179-2.50r.

Surface Technology, Inc.: *See—*
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Suzuki, Kikuji: *See—*
Hasegawa, Haruo; Sugiyama, Kimroku; Suzuki, Kikuji; and Hirano, Kunio, 3,672,888.

Suzuki, Shigeru; Sugita, Keiji; and Nagahara, Yasumori, to Ricoh Co., Ltd. Electrophotographic copying machine. 3,672,762, Cl. 355-10.000.

Suzuki, Toshi: *See—*
Wada, Yoshiyo; Kinjo, Hisao; Suzuki, Toshi; and Akuwa, Fumio, 3,673,352.

Svec, Zdenek: *See—*
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Mattsson, Mats Erik; and Lindelow, Claes-Goran, 3,672,566.

Svokos, Steve George; and Angier, Robert Bruce, to American Cyanamid Company. 1,4-Diphenyl-3,6-[dimercapto or epi(dithia or tetrathia] 2,5-piperazinediones. 3,673,172, Cl. 260-239.3.

Swain, Charles Gardner, to Massachusetts Institute of Technology. Voltage sensing switch. 3,673,502, Cl. 328-146.000.

Swanson, Wesley S.: *See—*
McCarty, William R., Jr.; Dolter, Paul A.; and Swanson, Wesley S., 3,672,627.

Swearingen, Kent W.: *See—*
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Sweet, Ervin J.: *See—*
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Sweetheart Plastics, Inc.: *See—*
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Anderson, Harry T., 3,673,065.

Switzer, Norris H.: *See—*
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Swodenk, Wolfgang; Schwerdtel, Wulf; Losacker, Paul; and Engelhard, Bruno, to Farbenfabriken Bayer Aktiengesellschaft. Isoprene recovery. 3,673,265, Cl. 260-681.000.

Symes, Clifford Edward, to GTE Automatic Electric Laboratories Incorporated. Crossbar switch. 3,673,366, Cl. 200-175.000.

Symonds, Willard G., to Eastman Kodak Company. Apparatus for severing a sheet. 3,672,252, Cl. 83-582.000.

Syntex Corporation: *See—*
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Synvar Associates: *See—*
McConnell, Harden M.; and Ullman, Edwin F., 3,673,207.

Syrjanen, Ahti, to Jylhavaara Osakeyhtio. Pressure strainer device. 3,672,506, Cl. 209-273.000.

Szala, Norman M.: *See—*
Van Der Sluys, William; O'Neill, Thomas J.; and Szala, Norman M., 3,672,309.

Sze, Simon Min: *See—*
Coleman, Donald James, Jr.; and Sze, Simon Min, 3,673,514.

Szymber, Oleg; and Shim, Norman, to GAF Corporation. Automatic focusing system for projectors and the like. 3,672,757, Cl. 353-101.000.

Tabankin, Phyllis. Sequentially-operable hidden camera device. 3,672,269, Cl. 95-11.

Tabet Manufacturing Co., Inc.: *See—*
Tabet, Michael A., 3,673,484.

Tabet, Michael A., to Tabet Manufacturing Co., Inc. Remote servo control circuit for remote controlled switches and switchboards. 3,673,484, Cl. 318-674.000.

Tacke, Peter; Binsack, Rudolf; and Weissel, Oskar, to Farbenfabriken Bayer Aktiengesellschaft. 2,2',4,4'-Tetrachloro-5,5'-diaminodiphenyl ether. 3,673,123, Cl. 260-571.000.

Tackett, Raymond W., to Burroughs Corporation. Luminous gas alphanumeric display device. 3,673,451, Cl. 313-109.500.

Tagawa, Takao, to Sharp Kabushiki Kaisha. Electrostatic printing apparatus. 3,673,599, Cl. 346-74.0cr.

Taiyo Kogyo Company Limited: *See—*
Sakamoto, Junzo; Nozaki, Tadashi; Tsuji, Yoshifumi; and Shimada, Masaharu, 3,672,561.

Takacs, Kalman: *See—*
Harsanyi, Kalman; Takacs, Kalman; Relle, Zsuzsa, nee Somfai; Milak, Eva, nee Krompecher; Tardos, Laszlo; Korbonits, Dezso; Kiss, Pal; and Gonczy, Csaba, 3,673,188.

Takahashi, Akira; Kojima, Hiroo; Ogawa, Masao; Osuka, Hiroshi; and Kobayashi, Shoichi, to Showa Denka Kabushiki Kaisha. Thermoplastic resin having high impact strength. 3,673,279, Cl. 260-876.00r.

Takahashi, Hiroshi, to Daicel Ltd. Process for manufacturing 3,3,5-trimethylcyclohexyl mandelate. 3,673,239, Cl. 260-473.00a.

Takahashi, Isoji: *See—*
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Takahashi, Kenji; Yamamura, Toshio; Ono, Mitsuzo; and Eda, Korekiyo, to Kanegafuchi Boseki Kabushiki Kaisha. Method of producing polyvinyl acetal porous articles. 3,673,125, Cl. 260-2.50f.

Takahira, Jiro: *See—*
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Takenoshita, Mitsuaki: *See—*
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Takeuchi, Masatoshi: *See—*
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Takimoto, Masaaki: *See—*
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Talbot, Meldon L.; and Foster, Theodore T., to Syntex Corporation. Dicyclopentadienyl iron compounds. 3,673,232, Cl. 260-439.0cy.

Tallman, Richard L.: *See—*
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Tamai Yasuo: *See—*
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Tamai, Yasuo; and Honjo, Satoru, to Fuji Photo Film Co., Ltd. Method of manufacturing bases for electrostatic recording material or electrophotographic material. 3,672,988, Cl. 117-215.000.

Tamura, Takaaki; and Kato, Tsutomu, to Kachita Co., Ltd. Method for oxidizing carbon monoxide contained in room air. 3,672,824, Cl. 23-4.000.

Tanabe Swiyaku Co., Ltd.: *See—*
Yoneda, Naoto; Ishihara, Teruo; Kobayashi, Tetsuji; Kondo, Yasuzo; Okumura, Kentaro; Kojima, Michio; and Nose, Takashi, 3,673,195.

Tanaka, Akira; Hattori, Tsuyoshi; Anno, Hirotomo; and Kawahara, Testuyo, to Japanese Geon Company, Ltd., The. Vinyl chloride polymer blended with a nitrile-methacrylate-acrylate terpolymer. 3,673,283, Cl. 260-898.000.

Tanaka, Hiroshi: *See—*
Inoue, Eiichi; Yamaji, Keizo; Tanaka, Hiroshi; and Saito, Takashi, 3,673,595.

Tanaka, Takashi; and Nomura, Yasuo, to Matsushita Electric Industrial Co., Ltd. Multi-channel dual-gap magnetic head. 3,672,044, Cl. 29-603.000.

Tang, Pak Chong: *See—*
Olsen, Perry Charles; and Tang, Pak Chong, 3,673,318.

Taniguchi, Hiroshi; Nakamura, Takahiro; and Sakumoto, Hideki, to Matsushita Electric Industrial Co., Ltd. Automatic tape feed controlling means. 3,673,414, Cl. 250-206.000.

Taniguchi, Masaharu: *See—*
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Taniguchi, Masanobu: *See—*
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Tardos, Laszlo: *See—*
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Tartan Industries, Inc.: *See—*
Foster, James L., Jr., 3,672,455.

Tausch, Gilbert H.: *See—*
Watkins, Fred E.; and Tausch, Gilbert H., 3,672,397.

Taut, Karl H. Modular, knock-down furniture. 3,672,739, Cl. 312-107.000.

Taylor, Clarence R.: *See—*
Knowles, Frederick G.; and Taylor, Clarence R., 3,672,593.

Taylor, Francis R.: *See—*
Lane, George A.; Smith, William Arthur; Dollman, Stephen C.; Kaye, Seymour M.; and Taylor, Francis R., 3,673,013.

Taylor, Geoffrey Gordon, to Fruitgrowers Chemical Campany Limited. Granules comprising inert cores coated with an absorbent powder. 3,672,945, Cl. 117-100.00b.

Taylor, Roland C. Delay equalizer network including negative delay circuits. 3,673,520, Cl. 333-28.00r.

TDK Electronics Co., Ltd.: *See—*
Ueoka, Hisayoshi; Horii, Kazuo; and Umeya, Kazumasa, 3,673,119.

Teague, Ernest Douglas, to Norton Abrasives Limited. Manufacture of plaster of Paris mold having sprayed metal oxide linings and product. 3,673,293, Cl. 264-60.000.

Technitrol, Inc.: *See—*
Storey, William T., II; Procter, Robert F.; Snyder, Charles H. A.; Jacob, George M.; and Mooney, Raymond T., 3,672,046.

Technology Application Services Corporation: *See—*
Camacho, Salvador L., 3,673,375.

Teichner, Stanislas Jean; and Gilbert, Andre Nicolaon, to Etat Francais represente par le Ministre des Armees Delegation Ministerielle pour l'Armement. Method of preparing inorganic aerogels. 3,672,833, Cl. 23-182.00r.

Teitelbaum, Bernard R.: *See—*
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Teledyne, Inc., mesne: *See—*
Bienert, Walter B.; Levedahl, William J.; and Streb, Alan J., 3,672,443.
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Telefonaktiebolaget L M Ericsson: *See—*
Edstrom, Nils Herbert; and Hemdal, Goran Anders Henrik, 3,673,577.

Telefunken Patentverwertungsgesellschaft m.b.H.: *See—*
Kaiser, Reinhold, 3,673,012.
Kersten, Karl-Heinz; and Patschan, Wolfgang, 3,673,515.

Temple, Sidney J.: *See—*
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Drugmand, Lester D.; and Temple, Sidney J., 3,673,386.

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Tenneco Chemicals, Inc.: *See—*
Di Bella, Eugene P., 3,673,257.
Ferstenberg, Charles, 3,672,348.

Tepper, Sidney; Tierney, William; and Lilinga, Nicholas, to Topper Corporation. Walking mechanism for a doll. 3,672,082, Cl. 40-106.360.

Tepper, Sidney; and Lalinga, Nicholas, to Topper Corporation. Animating device for a doll. 3,672,092, Cl. 46-1.00r.

Termin, Erich: *See—*
Dijkhuizen, Willem; Termin, Erich; Bleh, Otto; and Morgenstern, Dieter, 3,673,159.

Terrels, Joseph L.; and Meneses, Robert. Container and stirrer for paint sprayer. 3,672,645, Cl. 259-122.000.

Terreni, Giansandro. Demountable fishing lure with interchangeable elements. 3,672,086, Cl. 43-42.090.

Terry, John Brian, to Marconi Company Limited, The. Time division data transmission system having interrogation signal passed through matrix switches to junctors via all free paths. 3,673,568, Cl. 340-147.00r.

Teubler, Adolf; and Eversheim, Paul, to Vereinigte Leichtmetall-Werke GmbH. Aluminum offset printing plate. 3,672,878, Cl. 75-141.000.

Tewksbury, Floyd L., Jr.; and Demler, Walter R., to Allied Chemical Corporation. Process for preparing 2-[2-arylamino-vinyl]-1-lower alkyl-3-H-indolium salt dyes. 3,673,178, Cl. 260-240.800.

Texaco Development Corporation: *See—*
Goldsby, Arthur R., 3,673,271.

Texaco Inc.: *See—*
Hoyt, Donald L., 3,672,448.
Loffbourrow, Robert J., 3,673,398.
Schlinger, Warren G.; and Kaufman, Harold C., 3,673,080.
Vermillion, Herbert E.; and O'Loughlin, James J., 3,672,852.
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Texas Instruments, Incorporated: *See—*
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Textron, Inc.: *See—*
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Thaddey, Kurt: *See—*
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Theriot, Gilbert A.: *See—*
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Thermoformed Plastics Corporation: *See—*
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Thermoplastic Processes Inc.: *See—*
Du Pont, Paul R., 3,673,401.

Thielen, Heinz; Grundmann, Harald; and Putz, Franz, to Rheinische Braunkohlenwerke AG. Vehicle brake condition testing and signalling arrangement. 3,673,563, Cl. 340-71.000.

Thies, Charles E.; Thompson, Bernard L.; and Anderson, Stanley E., to United States of America, Army, mesne. Method of making cast-in-place end-burning propellant grains. 3,673,287, Cl. 264-3.000.

Thomas & Betts Corporation: *See—*
Fiorentino, Arthur A., 3,672,615.
Garner, Peter, 3,673,543.

Thomas, David Michael, to International Standard Electric Corporation. Time division multiplex switches. 3,673,336, Cl. 179-15.0bd.

Thomas, Ieuan: *See—*
Buckley, Alan; and Thomas, Ieuan, 3,673,162.

Thompson, Bernard L.: *See—*
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Thompson, Charles J.: *See—*
Carmody, William D.; Thompson, Charles J.; and Butzler, George J., 3,673,126.

Thompson, Donald F.; Quartermus, George D.; and Quinn, Thomas M., to Avisun Corporation. Composite sheet. 3,672,944, Cl. 117-76.00f.

Thorne-Booth, George M., to Westinghouse Electric Corporation. Vehicle control system and method. 3,672,611, Cl. 246-28.00r.

Thornton, James. Reusable forms for casting columns. 3,672,626, Cl. 249-48.000.

Thorstenson, Rolf A., to Avco Corporation. Turbine blade having a cooled laminated skin. 3,672,787, Cl. 416-97.000.

Thrasher, John Peter, to Gureckis, Peter V. Underground radio communication system for roadways. 3,673,497, Cl. 325-180.000.

Tibbetts, Alan R.; and Tucker, Donald R., to Airco, Inc. Ambient air vaporizer. 3,672,446, Cl. 165-183.

Ticknor, Sergei L., to Jerrold Electronics Corporation, mesne. Resistorless radio frequency hybrid signal splitter. 3,673,517, Cl. 333-8.000.

Tiedtke, Alfred: *See—*
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Tiemann, Jerome J.; and Gitzendanner, Louis G., to General Electric Company. Magnetic transducer having a composite magnetic core structure. 3,673,353, Cl. 179-100.20c.

Tierney, William: *See—*
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Timken Company, The: *See—*
Barnbrook, Thomas George; and Wren, Frederick James, 3,672,019.
Keller, Thomas C.; and Heggy, Robert F., 3,672,735.

Timko, Charles A., to Continental Can Company, Inc. Method for electrostatically holding particles along a mold surface. 3,673,296, Cl. 264-24.000.

Tinsley, John D.: *See—*
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Titeflex, a Division of Atlas Corporation: *See—*
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Titt, Georg. Worm gear drive. 3,672,239, Cl. 74-425.000.

Tizon Chemical Corporation: *See—*
Gambale, James Richard; McIntyre, Glenn Hazel, Jr.; and Ranney, Fredrik J., 3,672,825.

Tobey, Ray; and Lankford, David L., to Automation Industries, Inc. Apparatus for electroplating the interior of an elongated pipe. 3,673,073, Cl. 204-226.000.

Todd, Chester F., to Southwire Company. Method of preparing pouring spout. 3,673,039, Cl. 156-293.000.

Toepel, Rosemarie; Abel, Heinz; Maeder, Arthur; and Leifels, Klaus-Dieter, to Ciba Limited. Polyaddition products and process for their manufacture. 3,673,558, Cl. 260-29.2ep.

Tohoku Special Steel Works Limited: *See—*
Matsumoto, Jiro; Takeuchi, Masatoshi; Abe, Arimichi; and Sengoku, Koji, 3,673,010.

Tokura, Susuma: *See—*
Matsui, Maso; Utsuhara, Yutaka; Yamabe, Masahiro; and Tokura, Susuma, 3,672,802.

Tokyo Broadcasting System, Inc.; and: *See—*
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Tokyo Shibaura Electric Co., Ltd.: *See—*
Niioka, Takeharu; and Hosokawa, Ryoji, 3,673,351.

Tolar, James H., to Tenna Corporation. Universal cartridge-type tape recorder and playback instrument. 3,672,685, Cl. 274-4.00g.

Toledo Stamping & Manufacturing Co.: *See—*
Scheppele, Lyle W., 3,672,334.

Tolmie, Robert J., to Sperry Rand Corporation. Control means for a rechargeable battery. 3,673,001, Cl. 136-110.000.

Tomalia, Donald A.; and Glesner, William K., to Dow Chemical Company, The. Polymeric adhesive containing a polyepoxide, a carboxy terminated polybutadiene and a bis-2-oxazoline. 3,673,274, Cl. 260-836.000.

Tomaszewski, Thaddeus W., to Udylite Corporation, The. Electrolytic codeposition of copper with fine particles. 3,672,970, Cl. 204-52.00r.

Tomeoku, Hiroshi: *See—*
Kawabe, Ushio; Kimura, Hiroshi; Tomeoku, Hiroshi; and Doi, Toshio, 3,673,444.

Tomica, Alojzy; and Blackwell, John Francis, to International Standard Electric Corporation. Apparatus for forming electric cables. 3,672,141, Cl. 57-12.

Tomlinson, Charles W., to Acme Visible Records, Inc. Conveyor drop box. 3,672,663, Cl. 271-64.000.

Tomlinson, Kenneth: *See—*
Mitchell, Harry Ian; and Tomlinson, Kenneth, 3,672,993.

Tomlinson, Roy, to Connollys (Blackley) Limited. Method of impregnating and coating stranded bodies. 3,672,974, Cl. 117-115.000.

Tommaney, Joseph W., to Allegheny Ludlum Steel Corporation. Power partition control for consumable electrode furnaces. 3,672,428, Cl. 164-52.000.

Tomoegawa Papaer Manufacturing Co., Ltd.: *See—*
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Topper Corporation: *See—*
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Torres, Mario A., to California Computer Products, Inc. Tape storage buffer. 3,672,599, Cl. 242-184.000.

Toshiba Kikai Kabushiki Kaisha: *See—*
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Toth, Alex; and Fesmire, Robert H., to Ellis Corporation. Loading structure and method for laundry machines. 3,672,820, Cl. 8-150.000.

Townsend Engineering Company: *See—*
Greider, Charles Austin, 3,672,001.

Toyonaga, Ryuya; and Sato, Kazuo, to Nippon Hoso Kyokai. Porous layer of a secondary electron multiplier and a method of manufacturing the same. 3,672,989, Cl. 117-224.000.

Toyooka, Morio: *See—*
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Traber, Walter: *See—*
Frick, Wilhelm Ernst; Weiss, Anton G.; Wenger, Thomas; and Traber, Walter, 3,673,209.

Trachtenberg, William, to Eastman Kodak Company. Process of transferring an electrostatic charge pattern without using external pressure or electrode bias. 3,672,930, Cl. 117-37.0le.

Traunecker, Werner: *See—*
Schromm, Kurt; Mentrup, Anton; Zeile, Karl; Renth, Ernst-Otto; Engelhardt, Albrecht; and Traunecker, Werner, 3,673,187.

Trautwein, Paul A. Rotary dock. 3,672,178, Cl. 61-46.000.

Travers, Frederick W., to Dennison Manufacturing Company. Conductive base sheet for electrophotographic reproduction sheet. 3,672,982, Cl. 117-201.000.

Travor, Bruce W.; and Pitney, Lennord L., to United States of America, Army. Cartridge actuating device. 3,672,254, Cl. 89-1.00b.

Trcka, Ronald; and Sherrick, Paul H., to Sargent-Welch Scientific Company. Analytical method and apparatus using diffusion across a boundary between liquids. 3,672,838, Cl. 23-230.00r.

Trepka, William J., to Phillips Petroleum Company. 1,2-Dialkoxybenzenes as randomizer for copolymerization. 3,673,166, Cl. 260-83.700.

Trevillyan, Alvin E., to Atlantic Richfield Company. Process for the recovery of cobalt catalyst. 3,673,154, Cl. 260-524.

Trieschmann, Hans-Georg; Unterstenhoefer, Leo; and Berbner, Heinz, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Molding material based on bitumen. 3,673,141, Cl. 260-28.5as.

Trimble, Cebern B.; and Skutt, Robert R., to National Cash Register Company, The. Miniature magnetic head. 3,672,043, Cl. 29-603.000.

Trimble, John Omer; and Demler, Henry William, Sr., to AMP Incorporated. Method and apparatus for tapping pipeline. 3,672,383, Cl. 137-15.000.

Trimpler, Walter, to Diehl. Synchronous alarm clock mechanism. 3,672,151, Cl. 58-5.000.

Triolo, Peter T.; and Schutte, Harlan H., to Scovill Manufacturing Company. Die assembly. 3,672,806, Cl. 425-406.000.

Tripp, Robert W., to Inductorsyn Corporation. High speed digital tracking system. 3,673,395, Cl. 235-151.110.

Tripp, Robert W.; and Geller, Robert Z., to Inductosyn Corporation. Position measuring transformer having multiple independent sections for reduction of measurement errors. 3,673,585, Cl. 340-198.000.

Truck Equipment Corporation: *See—*
Linville, Roy Norman, 3,672,520.

Truhan, Andrew: *See—*
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TRW, Inc.: *See—*
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Brooks, Robert E., 3,672,776.
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Luckey, George R., 3,672,104.
Olson, Gaylor G., 3,673,412.

Tschopp, Werner. Stabilizing magnetic fields. 3,673,465, Cl. 317-123.000.

Tsubakimoto Chain Manufacturing Company Limited: *See—*
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Tsuchiya, Takuzo: *See—*
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Tsujimura, Kimiaki; and Moriya, Tosio, to Fuji Photo Film Co., Ltd. Method of continuously perforating a web and apparatus for the same. 3,672,248, Cl. 83-37.000.

Tsutsomi, Tadao: *See—*
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Tsutsui, Nobuhiro: *See—*
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Tucker, Donald R.: *See—*
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Tucker, William Henry, to Anchor Hocking Corporation. Blank and display stand for stemware. 3,672,514, Cl. 211-73.000.

Tuel, Donald F. Anchors with powered, movable flukes. 3,672,321, Cl. 114-208.

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Ueoka, Hisayoshi; Horii, Kazuo; and Umeya, Kazumasa, to TDK Electronics Co., Ltd. Semiconducting ceramic compositions. 3,673,119, Cl. 252-520.000.

Ufer, Erich, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Drive engine having shrouded propeller with a variable outlet cross section. 3,672,169, Cl. 60-230.000.

Ullman, Edwin F.: *See—*
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Urban, Peter, to Universal Oil Products Company. Process for treating two gas streams. 3,672,837, Cl. 23-225.000.

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Van Der Sluys, William; O'Neill, Thomas J.; and Szala, Norman M., to Pullman Incorporated. Welded light alloy car construction. 3,672,309, Cl. 105-401.000.

Van Dine, Gilbert August, to Bell Telephone Laboratories, Incorporated. Impedance matching transformer for coupling transmission lines. 3,673,519, Cl. 333-6.000.

Van Nice, Robert I., to Westinghouse Electric Corporation. Electrical windings. 3,673,530, Cl. 336-70.000.

Van Patten, Robert E., to United States of America, Air Force. Adjustable hydraulic/electric hand grip dynamometer. 3,672,219, Cl. 73-379.000.

Van Pee, Paul Desire: *See—*
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Van Stappen, Albert Louis; and Schwarz, Karl, to Du Pont de Nemours, E. I., and Company. Photographic silver halide emulsion with improved safe-light sensitivity. 3,672,902, Cl. 96-107.

Vander Ploeg, John Herman; and Weener, Earl, to Chemetron Corporation. Process for alkylating perylene pigments. 3,673,192, Cl. 260-281.000.

Vanreusel, Gerard Laurens: *See—*
Vrancken, Marcel Nicolas; Vanreusel, Gerard Laurens; Van Pee, Paul Desire; and De Laet, Jules Maria, 3,672,892.

Vasta, Joseph A., to Du Pont de Nemours, E. I., and Company. Abrasion resistant coating composition of an acrylic polymer, a polyester and a thermosetting constituent. 3,673,148, Cl. 260-39.00r.

Veda, Inc.: *See—*
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Vereinigte Leichtmetall-Werke GmbH: *See—*
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Vermillion, Herbert E.; and O'Loughlin, James J., to Texaco Inc. Liquefied petroleum gas fuel composition. 3,672,852, Cl. 44-52.000.

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Veroman, Viktor Jurievich; Rozanov, Vladimir Alexeevich; and Rabinovich, Mikhail Yakovlevich. Copying system for cutting out articles of complex shape by the electroerosion method. 3,673,372, Cl. 219-69.00v.

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Victor Comptometer Corporation: *See—*
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Vignini, Walter R., to Sonotone Corporation. Carrier for variable battery retention. 3,673,002, Cl. 136-173.000.

Vigorito, Benito. Exercising device. 3,672,094, Cl. 46-62.000.

Vilagi, Burton J.: *See—*
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Virnig, Herbert J., to Mass Feeding Corporation. Food tray having a laminated closure that is heat-retractable. 3,672,916, Cl. 99-171.00h.

Visnovits, Gabor: *See—*
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Vissers, Herbert, to Landbouwerktuigen-en Machine-Fabriek H. Vissers N.V. Machine for digging soil. 3,672,453, Cl. 172-39.000.

Vital, Zoltan; and Orban, Jean, to Photronic International Establishment. Double electric converter. 3,673,485, Cl. 320-2.000.

Vitek, Edmund J.; and Yeates, Robert A., to Westinghouse Electric Corporation. Electron beam magnetometer sensor. 3,673,494, Cl. 324-41.000.

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Vockroth, William Joseph, to AMP Incorporated. Internally fired feed thru dead end connector. 3,673,312, Cl. 174-79.000.

Volinskie, Robert, to AMP Incorporated. Composite electrical and fluid or air connector. 3,673,541, Cl. 339-16.00r.

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Von Der Eltz, Hans-Ulrich; Jeths, Johannes; and Boecker, Alfons Bernhard, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for dyeing mixtures of polyester and polyacrylonitrile fibers in one bath. 3,672,815, Cl. 8-21.00a.

Von Hippel, Hans Joachim. Method and apparatus for supporting the roofs in underground excavations. 3,672,174, Cl. 61-45.000.

Voorhis, Harold W.; and Post, Bradford, to Continental Can Company, Inc. Locks for egg carton covers. 3,672,560, Cl. 229-44.000.

Voorman, Henry, Jr., to Wagner Electric Corporation. Information recorder. 3,673,608, Cl. 346-18.000.

Vorsteher, Werner, to Anba Sportmode Vorsteher KG. Ski pants. 3,671,975, Cl. 2-232.000.

Voss, Raymond G. Angle gage mechanism. 3,672,065, Cl. 33-185.00r.

Vosteen, Robert E. Anti-jamming circuit for multi-frequency signal detector. 3,673,343, Cl. 179-84.0vf.

Vrancken, Marcel Nicolas; Vanreusel, Gerard Laurens; Van Pee, Paul Desire; and De Laet, Jules Maria, to Agfa-Gevaert N.V. Method for the preparation of a planographic printing master. 3,672,892, Cl. 96-33.000.

Vullo, William J.: *See*—
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Vyzkumny Ustav Bavlnarsky: *See*—
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Wacker-Chemie G.m.b.H.: *See*—
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Wada, Yoshiyo; Kinjo, Hisao; Suzuki, Toshi; and Akuwa, Fumio, to Victor Company of Japan, Limited. Magnetic head assembly. 3,673,352, Cl. 179-100.20c.

Wadensten, Theodore S. Rotating pneumatic vibrator. 3,672,639, Cl. 259-1.00r.

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Wagner Electric Corporation: *See*—
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Wagner, George M.; and Vullo, William J., to Hooker Chemical Corporation. Polyisocyanate composition and process for treating cellulosic materials therewith to render them water repellant. 3,672,818, Cl. 8-116.200.

Wagner, Heinrich, Maschinenfabrik: *See*—
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Wagner, Karl; and Ganser, Josef, to Agfa-Gevaert Aktiengesellschaft. Photographic apparatus with built-in electrical moving-coil measuring instrument. 3,672,270, Cl. 95-11.00l.

Wagner, Karl; and Nicolay, Klaus, to Agfa-Gevaert Aktiengesellschaft. Automatic exposure control for photographic apparatus. 3,672,271, Cl. 95-10.0ct.

Wagner, Karl; and Durr, Helmut, to Agfa-Gevaert Aktiengesellschaft. Device for adjustment of shutters and diaphragms in photographic apparatus. 3,672,286, Cl. 95-64.00c.

Wahle, Gunter; and Kasparek, Alois, to Hauni-Werke Korber & Co. KG. Apparatus for feeding rod shaped articles to consuming machines. 3,672,522, Cl. 214-302.000.

Wahli, Robert, to Ciba-Geigy AG. Photoelectric scanning apparatus for detecting code markings. 3,673,417, Cl. 250-219.00d.

Waite, John H.; and Nodine, John H. Method of examination of cell samples using a radioactively tagged dye. 3,673,410, Cl. 250-106.00t.

Wakefield, Shirley L., to Avco Corporation. Production of lead-tin-telluride material for infrared detectors. 3,673,063, Cl. 204-140.500.

Waldbillig, James O.; Wiley, Morris A.; Rambo, Marvin L.; and Millendorf, Alfred J., to Texaco Inc. Sulfurization of triisobutylene and products resulting therefrom. 3,673,090, Cl. 252-45.000.

Waldman, Nathan: *See*—
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Walker, Fred J.: *See*—
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Walker, Grant W.: *See*—
Young, Bruce O.; Walker, Grant W.; Ford, Duane B.; and Seegmiller, Wan, 3,672,657.

Walking, W. Douglas, to Lilly, Eli, and Company. Pharmacological preparation containing an acronycine -polyvinylpyrrolidone coprecipitate. 3,673,163, Cl. 260-279.00r.

Wall Colmonoy Corporation: *See*—
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Walley, Gerald D., to British Aircraft Corporation Limited. Trolley for recoverable spacecraft. 3,672,606, Cl. 244-1.0ss.

Walter, Dieter; Fries, Walter; and Gotte, Ernst, to Henkel & Cie G.m.b.H. Protein solubilizing washing rinsing and soaking compositions. 3,673,096, Cl. 252-89.000.

Walters, Anthony George, to Salopian Industries Metals Limited. Egg collecting apparatus. 3,672,485, Cl. 198-26.000.

Walters, Ronnie G., to Allen-Bradley Company. Servo amplifier. 3,673,512, Cl. 330-97.000.

Walton, Richard S.: *See*—
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Walz, Kurt: *See*—
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Wang, Teh Po: *See*—
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Ward, Eric John: *See*—
Smith, Gordon Victor; and Ward, Eric John, 3,673,371.

Ward, John; and Paterson, Ross, to Commonwealth of Australia, The; care of Secretary of Supply, The. Thickness control system for multilayer optical thin film work. 3,673,420, Cl. 250-219.0th.

Watai, Mitsuo; and Koya, Ito, to Hitachi, Ltd. Induction disc type relay. 3,673,446, Cl. 310-172.000.

Watanabe, Masahide: *See*—
Katsuyama, Shigeo; Asami, Atsumi; Watanabe, Masahide; Sato, Tsutomu; Norimatsu, Toshiaki; and Nakajima, Eizo, 3,672,819.

Watkins, Fred E.; and Tausch, Gilbert H., to Camco, Incorporated. Well safety valve. 3,672,397, Cl. 137-529.000.

Watson, Frederick D.: *See*—
Mayse, Weldon D.; and Watson, Frederick D., 3,672,127.

Watson, Frederick D.; and Winslow, Joseph D., Jr., to Petrolite Corporation. Treater for resolving dispersions. 3,672,511, Cl. 210-519.000.

Watson, Kenneth, to Westland Aircraft Limited. Torque transducers. 3,672,213, Cl. 73-136.00a.

Wave Energy Systems, Inc.: *See*—
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Wayne, Alex, to Delavan Manufacturing Company. Nozzle. 3,672,578, Cl. 239-590.000.

Weaver, Frank C., to Stewart-Warner Corporation. Diaphragm pressure switch with integral stop means for diaphragm sealing. 3,673,369, Cl. 200-83.00b.

Weaver, Max A.; Straley, James M.; and Moore, William H., to Eastman Kodak Company. 1,3,4-Thiadiazolyl 1,3,4-Thiadiadiazolyl azo-3-cyclohexyl-aminoacylanilides dyes. 3,673,169, Cl. 260-158.000.

Weaver, Victor F., Inc.: *See*—
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Webb, Cleitus E., Jr.; and Johnson, Royce F., to Windsor Door Co., Inc. Swing-up door mullion. 3,672,098, Cl. 49-365.000.

Webb, Jervis B., Company: *See*—
Dehne, Clarence A.; and Folsom, Harold A., 3,672,306.

Weber, Robert L., to Scovill Manufacturing Company. Rest-inducing device. 3,672,354, Cl. 128-33.000.

Webinger, George P., to Container Corporation of America. Carton with product holding feature. 3,672,559, Cl. 229-39.00r.

Wecenske, Harold R.: *See*—
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Weckesser, Ernst: *See*—
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Weedon, Gene Clyde: *See*—
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Weener, Earl: *See*—
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Weil, Raoul B., to Monsanto Company. Temperature sensor. 3,672,221, Cl. 73-339.00r.

Weinhold, Gottfried: *See*—
Hirt, Wilhelm; Lehnerdt, Hagen; Weckesser, Ernst; Weinhold, Gottfried; and Wrigge, Friedrich Wilhelm, 3,673,074.

Weininger, Joseph L.; and Holub, Fred F., to General Electric Company. Ultrafine porous polymer article and method of making. 3,673,127, Cl. 260-2.500.

Weir, Dennis Douglas. Egg carton. 3,672,693, Cl. 229-44.00r.

Weisfeld, Joseph: *See*—
Ackerman, Joseph Francis; Weisfeld, Joseph; Savageau, Robert George; and Beerli, George, 3,673,140.

Weiss, Alvin Dennis: *See*—
Schroeder, Duane Arthur; Weiss, Alvin Dennis; and Giltner, Benedict Clare, 3,673,117.

Weiss, Anton G.: *See*—
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Weiss, Harvey I. Extendible lighting fixture. 3,673,402, Cl. 240-51.11r.

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Weld, Foster E.; Lassell, Robert W.; and McLeod, Robert B., to Gulf & Western Systems Company, mesne. Combined telephone-telegraphy system. 3,673,329, Cl. 179-3.000.

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White, Richard M.; Lee, Robert E.; and Turner, Charles W., to United States of America, Navy. Means for generating (a source of) surface and bulk elastic wares. 3,673,474, Cl. 318-116.000.

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Wirth, Wayne M., to Minnesota Mining and Manufacturing Company. Disk recorder with means to move the spindle perpendicular to its axis of rotation. 3,673,583, Cl. 340-174.10c.

Wiseman, John A.: *See—*
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Wiss, J., & Sons Co.: *See—*
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Wiswell, George C., Jr. Radiographic apparatus for underwater inspection of wooden pilings. 3,673,407, Cl. 250-52.000.

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Woods, Roger P. Light assembly raising and lowering mechanism with pin and dog device. 3,673,403, Cl. 240-64.000.

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Wright, John H., to General Electric Company. Methyl alkyl silicone grease composition and method of making same. 3,673,089, Cl. 252-42.100.

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Yasuda, Kentaro, to Otis Elevator Company. Rope tension gauge for elevator system. 3,672,214, Cl. 73-144.000.

Yasuda, Tetuya; Tutiya, Hidetaka; and Mori, Takeshi, to Citizen Watch Company Limited. Display dial assembly for timepiece. 3,672,150, Cl. 58-5.000.

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York, Charles Herbert-Greer, to Wire Core Development Corporation. Wire core structure for sandwich material. 3,672,022, Cl. 29-191.600.

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Young, Bruce O.; Walker, Grant W.; Ford, Duane B.; and Seegmiller, Wan, to Energy Absorption Systems, Inc. Liquid shock absorbing buffer. 3,672,657, Cl. 267-116.000.

Young, Charles H.; and Ray, Donald L., to Ski-Tow Manufacturing Co. Extendable and retractable supports. 3,672,238, Cl. 74-89.200.

Young, James Roger, to General Electric Company. Hydrocarbon responsive getter ion pump. 3,672,789, Cl. 417-51.000.

Young, Richard W.; and Malin, Murray E., to Polaroid Corporation. Photographic film exposure and viewing systems using coded film cassette. 3,672,752, Cl. 352-72.000.

Youngman, Gary: *See—*
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Yowell, Gordon H., to Sperry Rand Corporation. Power transmission. 3,672,793, Cl. 417-368.000.

Yuguchi, Hiroshi, to Kokusai Denshin Denwa Kabushiki Kaisha. Equalizing transmission loss utilizing graphical method for selecting equalizer networks. 3,673,521, Cl. 333-28.00r.

Yunoki, Tadao; and Fujiyasu, Toshio, to Kabushiki Kaisha Tadano. Extension means of a multi-stage boom. 3,672,257, Cl. 91-168.000.

Zaffaroni, Alejandro, to Alza Corporation. Indolol prostaglandin compounds. 3,673,213, Cl. 260-326.14r.

Zane, Victor H., to Design and Manufacturing Corporation. Electrically released latching switch for timer-controlled appliances and the like. 3,673,531, Cl. 337-77.000.

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Zeblisky, Rudolph John, to Kollmorgen Corporation. Novel precious metal sensitizing solutions. 3,672,938, Cl. 117-47.00a.

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Zemberry, William L., to United States Steel Corporation. Coupling device. 3,672,708, Cl. 285-315.000.

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Ziegler, George W., Jr., to AMP Incorporated. Connector for coaxial cable. 3,673,547, Cl. 339-89.00c.

Ziemianski, John P., to Allegheny Ludlum Steel Corporation. Method of making assemblies of stainless steel tubing. 3,672,036, Cl. 29-492.

Zimmerly, Robert D., to Ladish Co. Pumping system with controlled liquid addition. 3,672,791, Cl. 417-205.000.

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# LIST OF REISSUE PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 27TH DAY OF JUNE, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Bentley, Donald E., and R. L. Price, to Systron-Donner Corp. Force measuring system. Re. 27,411, 6–27–72, Cl. 73—141.

Bullard, E. D., Co.: *See*—
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Cork, Gordon H., to Gemco Electric Co. Electric switch mechanism. Re. 27,406, 6–27–72, Cl. 200—164.

Cutler, Arthur S., and D. F. Smith, to General Electric Co. Process for developing wound coils for electromagnetic devices. Re. 27,415, 6–27–72, Cl. 29—596.

Dunmore Co., The: *See*—
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Eastman Kodak Co.: *See*—
Williams, Robert F., Jr., and Jenks Re. 27,404.

Ehe, Albert L., and C. T. Milligan, to Multicup Automation Co. Inc. Candy packaging machine. Re. 27,405, 6–27–72, Cl. 53—126.

Ferro Mfg. Corp.: *See*—
Littmann, Joseph C. Re. 27,407.

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Cork, Gordon H. Re. 27,406.

General Electric Co.: *See*—
Cutler, Arthur S., and Smith. Re. 27,415.

Gorski, Walter: *See*—
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|---|---|
| 1CS | 3,672,011 |
| 1.2 | 3,672,012 |
| 71.3 | 3,672,013 |

**CLASS 29**

| | |
|---|---|
| 25.15 | 3,672,014 |
| 33K | 3,672,015 |
| 96 | 3,672,016 |
| 105 | 3,672,017 |
| 116AD | 3,672,018 |
| 148.4A | 3,672,019 |
| 157.3R | 3,672,020 |
| 159.01 | 3,672,021 |
| 191.6 | 3,672,022 |
| 195 | 3,672,849 |
| | 3,673,038 |
| 196 | 3,672,850 |
| 200P | 3,672,023 |
| 203D | 3,672,025 |
| 203H | 3,672,024 |
| 205R | 3,672,026 |
| | 3,672,027 |
| 208B | 3,672,028 |
| 243.56 | 3,672,029 |
| 401 | 3,672,030 |
| 417 | 3,672,031 |
| 424 | 3,672,032 |
| 470.1 | 3,672,033 |
| 471.1 | 3,672,034 |
| 471.3 | 3,672,035 |
| 492 | 3,672,036 |
| 497.5 | 3,672,037 |
| 527.6 | 3,672,038 |
| 596 | Re.27,415 |
| | 3,672,039 |
| | 3,672,040 |
| | 3,672,041 |
| 602 | 3,672,042 |
| 603 | 3,672,043 |
| | 3,672,044 |
| | 3,672,045 |
| 624 | 3,672,046 |
| 628 | 3,672,047 |

**CLASS 30**

| | |
|---|---|
| 90 | 3,672,049 |
| 99 | 3,672,050 |
| 123R | 3,672,051 |
| 130 | 3,672,052 |
| 267 | 3,672,053 |
| 294 | 3,672,054 |
| 358 | 3,672,055 |

**CLASS 31**

| | |
|---|---|
| 49 | 3,672,056 |

**CLASS 32**

| | |
|---|---|
| 5 | 3,672,057 |
| 10A | 3,672,058 |
| 22 | 3,672,059 |
| 26 | 3,672,060 |

**CLASS 33**

| | |
|---|---|
| 109 | 3,672,062 |
| 169R | 3,672,061 |
| 180L | 3,672,063 |
| 180R | 3,672,064 |
| 185R | 3,672,065 |

**CLASS 34**

| | |
|---|---|
| 1 | 3,672,066 |
| 15 | 3,672,067 |
| | 3,672,068 |
| 20 | 3,672,069 |
| 25 | 3,672,070 |

**CLASS 35**

| | |
|---|---|
| 9B | 3,672,071 |
| 29R | 3,672,075 |
| 31B | 3,672,072 |
| 34 | 3,672,073 |
| 35H | 3,672,074 |
| 48B | 3,672,076 |

**CLASS 36**

| | |
|---|---|
| 2.5T | 3,672,077 |
| 11.5 | 3,672,078 |

**CLASS 37**

| | |
|---|---|
| 69 | 3,672,079 |

**CLASS 38**

| | |
|---|---|
| 90 | 3,672,080 |

**CLASS 40**

| | |
|---|---|
| 70 | 3,672,081 |
| 106.36 | 3,672,082 |
| 126B | 3,672,083 |

**CLASS 42**

| | |
|---|---|
| 50 | 3,672,089 |
| 71P | 3,672,084 |

**CLASS 43**

| | |
|---|---|
| 15 | 3,672,085 |
| 27.4 | 3,672,091 |
| 42.09 | 3,672,086 |
| 44.88 | 3,672,087 |
| 44.97 | 3,672,088 |
| 66 | 3,672,090 |

**CLASS 44**

| | |
|---|---|
| 7B | 3,672,851 |
| 52 | 3,672,852 |
| | 3,672,853 |
| 66 | 3,672,854 |

**CLASS 46**

| | |
|---|---|
| 1R | 3,672,092 |
| 47 | 3,672,093 |
| 62 | 3,672,094 |
| 65 | 3,672,095 |
| 120 | 3,672,096 |
| | 3,672,097 |

**CLASS 49**

| | |
|---|---|
| 365 | 3,672,098 |

**CLASS 51**

| | |
|---|---|
| 3 | 3,672,099 |
| 101LG | 3,672,855 |
| 163 | Re.27,412 |
| 165.77 | 3,672,100 |
| 165.93 | 3,672,101 |
| 204 | 3,672,102 |
| 237R | 3,672,856 |

**CLASS 52**

| | |
|---|---|
| 20 | 3,672,103 |
| 109 | 3,672,104 |
| 148 | 3,672,105 |
| 188 | 3,672,106 |
| 235 | 3,672,107 |
| 367 | 3,672,108 |
| 400 | 3,672,109 |
| 608 | 3,672,110 |
| 666 | 3,672,111 |
| 712 | 3,672,112 |
| 741 | 3,672,115 |

**CLASS 53**

| | |
|---|---|
| 3 | 3,672,116 |
| 35 | 3,672,117 |
| 39 | 3,672,113 |
| 59R | 3,672,118 |
| 88 | 3,672,114 |
| 126 | Re.27,405 |
| 131 | 3,672,119 |
| 180 | 3,672,120 |
| 351 | 3,672,121 |
| 384 | 3,672,122 |

**CLASS 54**

| | |
|---|---|
| 2 | 3,672,123 |
| 38 | 3,672,124 |

**CLASS 55**

| | |
|---|---|
| 73 | 3,672,125 |
| 106 | 3,672,126 |
| 174 | 3,672,127 |
| 222 | 3,672,128 |
| 270 | 3,672,129 |
| 323 | 3,672,130 |
| 386 | 3,672,131 |

**CLASS 56**

| | |
|---|---|
| 1 | 3,672,132 |
| 13.5 | 3,672,133 |
| 14.2 | 3,672,135 |
| 14.4 | 3,672,134 |
| | 3,672,136 |
| 15.8 | 3,672,137 |
| 158 | 3,672,138 |
| 202 | 3,672,139 |
| 330 | 3,672,140 |

**CLASS 57**

| | |
|---|---|
| 12 | 3,672,141 |
| 17 | 3,672,142 |
| 53 | 3,672,143 |
| 58.95 | 3,672,144 |
| 60 | 3,672,145 |
| 81 | 3,672,146 |
| 157F | 3,672,147 |
| 159 | 3,672,148 |

**CLASS 58**

| | |
|---|---|
| 2 | 3,672,149 |
| 5 | 3,672,150 |
| | 3,672,151 |
| 23BA | 3,672,154 |
| 23TF | 3,672,153 |
| 23V | 3,672,152 |
| 50R | 3,672,155 |
| 58 | 3,672,156 |
| 88W | 3,672,157 |
| 90R | 3,672,158 |

**CLASS 60**

| | |
|---|---|
| 10.5 | 3,672,159 |
| 13 | 3,672,160 |
| 19 | 3,672,161 |
| 39.28R | 3,672,163 |
| 39.32 | 3,672,162 |
| 39.38 | 3,672,164 |
| 39.48 | 3,672,165 |
| 53R | 3,672,166 |
| | 3,672,167 |
| | 3,672,168 |
| 230 | 3,672,169 |
| 255 | 3,672,170 |
| 274 | 3,672,171 |
| 282 | 3,672,172 |

**CLASS 61**

| | |
|---|---|
| 36 | 3,672,173 |
| 45D | 3,672,174 |
| | 3,672,176 |
| 46 | 3,672,175 |
| | 3,672,178 |
| 46.5 | 3,672,177 |

**CLASS 62**

| | |
|---|---|
| 5 | 3,672,179 |
| 54 | 3,672,180 |
| 63 | 3,672,181 |
| 98 | 3,672,182 |
| 139 | 3,672,183 |
| 324 | 3,672,184 |

**CLASS 64**

| | |
|---|---|
| 26 | 3,672,185 |

**CLASS 65**

| | |
|---|---|
| 12 | 3,672,857 |
| 43 | 3,672,858 |
| 93 | 3,672,859 |
| 208 | 3,672,860 |
| 350 | 3,672,861 |

**CLASS 66**

| | |
|---|---|
| 25 | 3,672,186 |
| 192 | 3,672,187 |

**CLASS 68**

| | |
|---|---|
| 12R | 3,672,188 |
| | 3,672,189 |

**CLASS 70**

| | |
|---|---|
| 58 | 3,672,190 |
| 393 | 3,672,191 |
| 414 | 3,672,192 |

**CLASS 71**

| | |
|---|---|
| 79 | 3,672,862 |
| 82 | 3,672,863 |
| 103 | 3,672,864 |
| 106 | 3,672,865 |
| 121 | 3,672,866 |

**CLASS 72**

| | |
|---|---|
| 4 | 3,672,193 |
| 55 | 3,672,194 |
| 71 | 3,672,195 |
| 77 | 3,672,196 |
| 79 | 3,672,197 |
| 215 | 3,672,198 |
| 250 | 3,672,199 |
| 285 | 3,672,200 |
| | 3,672,201 |
| 369 | 3,672,202 |
| 469 | 3,672,203 |

**CLASS 73**

| | |
|---|---|
| 15A | 3,672,205 |
| 15R | 3,672,204 |
| 40.7 | 3,672,207 |
| 49.2 | 3,672,208 |
| 61LM | 3,672,209 |
| 61 | 3,672,206 |
| 67.9 | 3,672,210 |
| 71.5 | 3,672,211 |
| 99 | 3,672,212 |
| 136A | 3,672,213 |
| 141R | Re.27,411 |
| 144 | 3,672,214 |
| 154 | 3,672,215 |
| 339R | 3,672,221 |
| 343R | 3,672,216 |
| | 3,672,222 |
| 355EM | 3,672,217 |
| 362AR | 3,672,218 |
| 379 | 3,672,219 |
| 398R | 3,672,220 |
| 406 | 3,672,223 |
| 421R | 3,672,224 |
| 421.5R | 3,672,225 |
| 422GC | 3,672,226 |
| | 3,672,227 |
| 432R | 3,672,228 |
| 504 | 3,672,229 |
| 506 | 3,672,230 |
| 515 | 3,672,231 |
| 516R | 3,672,232 |

**CLASS 74**

| | |
|---|---|
| 2 | 3,672,233 |
| 3.52 | 3,672,234 |
| 5.6 | 3,672,235 |
| 25 | Re.27,403 |
| 32 | 3,672,236 |
| 89.2 | Re.27,407 |
| | 3,672,238 |
| 89.21 | 3,672,237 |
| 425 | 3,672,239 |
| 503 | 3,672,240 |
| 572 | 3,672,241 |
| 600 | 3,672,242 |
| 753 | 3,672,243 |
| 859 | 3,672,244 |

**CLASS 75**

| | |
|---|---|
| .5AA | 3,672,867 |
| .5A | 3,672,868 |
| 45 | 3,672,869 |
| 52 | 3,672,870 |
| 58 | 3,672,871 |
| 63 | 3,672,872 |
| 101R | 3,672,873 |
| | 3,672,874 |
| 112 | 3,672,875 |
| 124 | 3,672,876 |
| 126C | 3,672,877 |
| 141 | 3,672,878 |
| 170 | 3,672,879 |
| 172 | 3,672,880 |
| 208R | 3,672,881 |
| 211 | 3,672,882 |

**CLASS 81**

| | |
|---|---|
| 367 | 3,672,245 |

**CLASS 82**

| | |
|---|---|
| 2B | 3,672,246 |

**CLASS 83**

| | |
|---|---|
| 35 | 3,672,247 |
| 37 | 3,672,248 |
| 80 | 3,672,249 |
| 92 | 3,672,250 |
| 169 | 3,672,251 |
| 582 | 3,672,252 |

**CLASS 84**

| | |
|---|---|
| 1.01 | 3,673,303 |
| | 3,673,304 |
| 1.27 | 3,672,253 |

**CLASS 89**

| | |
|---|---|
| 1B | 3,672,254 |
| 42R | 3,672,255 |

**CLASS 90**

| | |
|---|---|
| 11A | 3,672,256 |

**CLASS 91**

| | |
|---|---|
| 168 | 3,672,257 |
| 355 | 3,672,258 |
| 382 | 3,672,259 |

**CLASS 92**

| | |
|---|---|
| 69 | 3,672,260 |
| 137 | 3,672,261 |
| 140 | 3,672,262 |
| 144 | 3,672,263 |

**CLASS 93**

| | |
|---|---|
| 12R | 3,672,264 |
| 49R | 3,672,266 |
| 93DP | 3,672,265 |

**CLASS 95**

| | |
|---|---|
| 10CE | 3,672,267 |
| | 3,672,268 |
| 10CT | 3,672,271 |
| 11L | 3,672,270 |
| 11R | 3,672,283 |
| 11 | 3,672,269 |
| 13 | 3,672,272 |
| | 3,672,273 |
| | 3,672,274 |
| | 3,672,275 |
| 19 | 3,672,276 |
| 31FM | 3,672,278 |
| 31R | 3,672,277 |
| | 3,672,279 |
| 39 | 3,672,280 |
| 42 | 3,672,281 |
| | 3,672,284 |
| 57 | 3,672,282 |
| 59 | 3,672,285 |
| 64C | 3,672,286 |
| 64R | 3,672,287 |
| 89D | 3,672,289 |
| 89R | 3,672,288 |
| 94R | 3,672,290 |

**CLASS 96**

| | |
|---|---|
| 1LY | 3,672,884 |
| 1 | 3,672,885 |
| 1.1 | 3,672,883 |
| | 3,672,886 |
| 1.2 | 3,672,887 |
| 1.8 | 3,672,888 |
| | 3,672,889 |
| 3 | 3,672,890 |
| 29R | 3,672,891 |
| 33 | 3,672,892 |
| 36.1 | 3,672,893 |
| 38.3 | 3,672,894 |
| 64 | 3,672,895 |
| 66HD | 3,672,896 |
| 74 | 3,672,897 |
| | 3,672,898 |
| 88 | 3,672,899 |
| 94 | 3,672,900 |
| | 3,672,901 |
| 107 | 3,672,902 |
| 108 | 3,672,903 |
| 114.1 | 3,672,904 |
| 140 | 3,672,905 |
| 142 | 3,672,906 |

**CLASS 98**

| | |
|---|---|
| 2.16 | 3,672,291 |
| 33 | 3,672,292 |
| 40VM | 3,672,293 |

**CLASS 99**

| | |
|---|---|
| 1 | 3,672,907 |
| | 3,672,908 |
| | 3,672,909 |
| 3 | 3,672,910 |
| 71 | 3,672,911 |
| 80 | 3,672,912 |
| 109 | 3,672,913 |
| 140R | 3,672,914 |
| 171LP | 3,672,915 |
| 171H | 3,672,916 |
| 199 | 3,672,917 |
| 237R | 3,672,294 |

**CLASS 100**

| | |
|---|---|
| 4 | 3,672,295 |

**CLASS 101**

| | |
|---|---|
| 38A | 3,672,296 |
| 93C | 3,672,297 |
| 350 | 3,672,298 |
| 426 | 3,672,299 |

**CLASS 102**

| | |
|---|---|
| 10 | 3,672,300 |
| 39 | 3,672,301 |

70.2R 3,672,302
3,672,303
92.3 3,672,304

**CLASS 104**

23FS 3,672,305
89 3,672,306
96 3,672,307
246 3,672,308

**CLASS 105**

96.2 3,672,310
401 3,672,309
447 3,672,311

**CLASS 106**

38.22 3,672,918
47Q 3,672,920
52 3,672,919
53 3,672,921
211 3,672,922
286 3,672,923
287 3,672,924

**CLASS 108**

69 3,672,312

**CLASS 112**

121.15 3,672,313
121.29 3,672,314
219A 3,672,316
219R 3,672,315

**CLASS 113**

1E 3,672,317
30 3,672,318

**CLASS 114**

74R 3,672,319
3,672,320
208R 3,672,321
235B 3,672,322

**CLASS 116**

28 3,672,323
70 3,672,325

**CLASS 117**

5.5 3,672,925
8 3,672,926
17 3,672,927
17.5 3,672,928
25 3,672,929
33.5CP 3,672,931
33.5C 3,672,932
34 3,672,933
36.8 3,672,935
37LE 3,672,930
38 3,672,934
46CC 3,672,936
47A 3,672,937
3,672,938
3,672,940
54 3,672,939
62 3,672,941
62.2 3,672,942
63 3,672,943
76F 3,672,944
100B 3,672,945
102L 3,672,946
104 3,672,947
106R 3,672,948
3,673,006
115 3,672,974
118 3,672,975
130R 3,672,976
138.8F 3,672,977
139.5CQ 3,672,978
201 3,672,979
3,672,980
3,672,981
3,672,982
212 3,672,983
3,672,984
3,672,985
3,672,986
3,672,987
215 3,672,988
219 3,672,992
224 3,672,989
230 3,672,990
235 3,672,991

**CLASS 118**

8 3,672,326
48 3,672,327
63 3,672,324
221 3,672,328
637 3,672,329
3,672,330

**CLASS 119**

1 3,672,331
17 3,672,332
51.5 3,672,333
52B 3,672,334
82 3,672,335

**CLASS 122**

149 3,672,336
156 3,672,337

**CLASS 123**

32EA 3,672,345
90.27 3,672,338
119A 3,672,340
119E 3,672,341
119R 3,672,339
122B 3,672,342
140MC 3,672,343
182 Re.27,410
198DB 3,672,344

**CLASS 124**

35 3,672,346
41 3,672,347

**CLASS 126**

110AA 3,672,349
350 3,672,350

**CLASS 128**

2G 3,672,351
2R 3,672,352
2.06A 3,672,353
33 3,672,354
36 3,672,355
49 3,672,357
57 3,672,356
58 3,672,358
66 3,672,359
67 3,672,360
71 3,672,361
76B 3,672,362
3,672,363
134 3,672,364
141R 3,672,365
145.8 3,672,366
214.4 3,672,367
218N 3,672,368
218P 3,672,369
227 3,672,370
290R 3,672,371
349R 3,672,372

**CLASS 131**

21R 3,672,373
243 3,672,374

**CLASS 132**

7 3,672,375
9 3,672,376
92R 3,672,377
93 3,672,378

**CLASS 134**

3 3,672,993
168R 3,672,379
172 3,672,380

**CLASS 135**

22 3,672,381
24 3,672,382

**CLASS 136**

6 3,672,994
3,672,995
3,672,996
20 3,672,997
30 3,672,998
89 3,672,999
107 3,673,000
110 3,673,001
173 3,673,002
236 3,673,003

**CLASS 137**

15 3,672,383
39 3,672,384
53 3,672,385
77 3,672,386
81.5 3,672,387
88 3,672,388
99 3,672,389
212 3,672,390
240 3,672,391
288 3,672,392
307 3,672,393
338 3,672,394
355.16 3,672,395
512 3,672,396
529 3,672,397
568 3,672,398
625.62 3,672,399
630.22 3,672,400

**CLASS 138**

31 3,672,402
43 3,672,401
89 3,672,403

**CLASS 139**

12 3,672,404
122R 3,672,405
127P 3,672,406
295 3,672,407

**CLASS 140**

92.2 3,672,409
102 3,672,408
103 3,672,410
147 3,672,411

**CLASS 143**

32N 3,672,412

**CLASS 144**

2Z 3,672,413
28.11 3,672,414
136 3,672,415
209R 3,672,416
218 3,672,417

**CLASS 145**

34R 3,672,418
65 3,672,419

**CLASS 146**

182 3,672,420

**CLASS 148**

3 3,673,004
6 3,673,005
12 3,673,007
3,673,008
12.3 3,673,009
31.57 3,673,010
175 3,673,011
187 3,673,012

**CLASS 149**

19 3,673,013
3,673,014
29 3,673,015

**CLASS 152**

208 3,672,421
222 3,672,422
356 3,672,423

**CLASS 156**

6 3,673,016
7 3,673,017
11 3,673,018
62.2 3,673,020
62.4 3,673,021
66 3,673,019
137 3,673,023
3,673,024
154 3,673,025
164 3,673,026
3,673,052
166 3,673,022
167 3,673,027
172 3,673,028
175 3,673,029
193 3,673,030
206 3,673,031
210 3,673,032
217 3,673,033
222 3,673,034
235 3,673,035
250 3,673,036
280 3,673,037
293 3,673,039
294 3,673,040
306 3,673,041
345 3,673,042
363 3,673,043
433 3,673,044
438 3,673,045
510 3,673,048
517 3,673,046
563 3,673,047

**CLASS 160**

40 3,672,424
331 3,672,425

**CLASS 161**

62 3,673,056
68 3,673,057
3,673,058
88 3,673,059
126 3,673,060
129 3,672,949
3,672,950
146 3,672,952
160 3,672,951
164 3,673,049
165 Re.27,404
3,673,050
166 3,673,051
177 3,673,053
183 3,673,055
189 3,673,054

**CLASS 164**

5 3,672,426
6 3,672,427
52 3,672,428
63 3,672,429
76 3,672,430
82 3,672,431
119 3,672,432
123 3,672,433
187 3,672,434
247 3,672,435
260 3,672,436
265 3,672,437
282 3,672,438
283 3,672,439
312 3,672,440
351 3,672,441

**CLASS 165**

22 3,672,442
32 3,672,443
39 3,672,444
42 3,672,445
183 3,672,446

**CLASS 166**

.6 3,672,447
245 3,672,448
260 3,672,450
292 3,672,449

**CLASS 171**

58 3,672,451

**CLASS 172**

19 3,672,452
39 3,672,453

**CLASS 174**

12BH 3,673,305
15R 3,673,306
25R 3,673,307
52PE 3,673,309
52S 3,673,308
58 3,673,310
73R 3,673,311
79 3,673,312
88C 3,673,314
90 3,673,313
107 3,673,315

**CLASS 175**

56 3,672,454
412 3,672,455

**CLASS 177**

201 3,672,456
3,672,457

**CLASS 178**

2R 3,673,316
5.2R 3,673,317
5.4HE 3,673,320
5.4R 3,673,319
5.8A 3,673,321
5.8R 3,673,318
6 3,673,322
6.8 3,673,323
3,673,324
7.5D 3,673,325
18 3,673,327
71R 3,673,326

**CLASS 179**

1SB 3,673,331
1N 3,673,328
2.5R 3,673,330
3 3,673,329
6E 3,673,332
7R 3,673,333
15AQ 3,673,335
15BD 3,673,336
15BT 3,673,342
17D 3,673,337
18BE 3,673,341
18ET 3,673,338
18F 3,673,339
18J 3,673,340
82 3,673,334
84VF 3,673,343
100.1C 3,673,344
100.2ZS 3,673,345
3,673,346
100.2C 3,673,350
3,673,352
3,673,353
100.2R 3,673,351
100.2T 3,673,347
3,673,349
100.2 3,673,348
100.41V 3,673,354
170.6 3,673,355
175 3,673,356

**CLASS 180**

8F 3,672,458
13 3,672,459
67 3,672,048
79.2B 3,672,460
127 3,672,461

**CLASS 181**

.5R 3,672,462
30 3,672,463
44 3,672,464
50 3,672,465
58 3,672,773

**CLASS 182**

3 3,672,466

**CLASS 184**

1C 3,672,467
15A 3,672,468

**CLASS 186**

1A 3,672,469

**CLASS 187**

1 3,672,470
27 3,672,471

**CLASS 188**

1B 3,672,472
266 3,672,473
277 3,672,475
282 3,672,474

**CLASS 192**

21.5 3,672,476
27 3,672,477
86 3,672,478

**CLASS 194**

13 3,672,479
92 3,672,480
101 3,672,481

**CLASS 195**

28 3,672,953
29 3,672,954
68 3,672,955
96 3,672,956
3,672,957

**CLASS 197**

1R 3,672,482
133 3,672,483

**CLASS 198**

16 3,672,484
26 3,672,485
127 3,672,486
165 3,672,487
189 3,672,488
219 3,672,489

**CLASS 200**

5A 3,673,357
6R 3,673,358
16C 3,673,364
16R 3,673,365
19R 3,673,359
48R 3,673,360
51.03 3,673,361
61.45R 3,673,362
3,673,367
67G 3,673,368
83B 3,673,369
153K 3,673,363
164R Re.27,406
175 3,673,366

**CLASS 202**

170 3,672,958
181 3,672,959

**CLASS 203**

11 3,672,960
37 3,672,961

**CLASS 204**

1T 3,672,962
14N 3,672,963
3,672,965
33 3,672,964
35N 3,672,966
38C 3,672,967
43 3,672,968
3,672,969
52R 3,672,970
55R 3,672,971
58 3,672,972
99 3,672,973
105R 3,673,061
112 3,673,062
140.5 3,673,063
147 3,673,064
149 3,673,065
162R 3,673,066
180P 3,673,067
3,673,068
186 3,673,070
192 3,673,071
195G 3,673,069
224 3,673,072
226 3,673,073
243R 3,673,074
245 3,673,075
256 3,673,076

**CLASS 206**

1R 3,672,490
29 3,672,491
46H 3,672,492
3,672,493
57R 3,672,494
65F 3,672,495

**CLASS 208**

76 3,673,077
89 3,673,078
111 3,673,079
131 3,673,080
313 3,673,081

**CLASS 209**

38 3,672,496
80.5 3,672,497
3,672,498
3,672,499
116 3,672,500
121 3,672,501
144 3,672,502
3,672,503
255 3,672,504
264 3,672,505
273 3,672,506

**CLASS 210**

12 3,673,082
18 3,673,083
23 3,673,084
33 3,673,085
59 3,673,086
77 3,672,507
128 3,672,508
321 3,672,509
438 3,672,510
519 3,672,511
523 3,672,512

**CLASS 211**

60R 3,672,513
73 3,672,514
176 3,672,515

**CLASS 214**

8.5A 3,672,516
16.1A 3,672,517
17DB 3,672,518
35R 3,672,519
82 3,672,520
145 3,672,521
302 3,672,522
506 3,672,523
515 3,672,524
674 3,672,525
730 3,672,526

**CLASS 215**

41 3,672,527
46A 3,672,528

**CLASS 219**

10.55 3,673,370
69G 3,673,371
69V 3,673,372
74 3,673,373
76 3,673,374
121LM 3,673,376
121P 3,673,375
131R 3,673,377
156 3,673,378
202 3,673,379
212 3,673,380
3,673,381
222 3,673,382
227 3,673,383
230 3,673,384
335 3,673,385
523 3,673,386
532 3,673,387

**CLASS 220**

1.5 3,672,529
4R 3,672,530
3,672,531
25 3,672,532
44R 3,672,533
46P 3,672,534
54 3,672,535
60R 3,672,536
85VR 3,672,537
97C 3,672,538

**CLASS 221**

63 3,672,540
68 3,672,541
161 3,672,542

**CLASS 222**

5 3,672,539
94 3,672,544
183 3,672,543
193 3,672,545
402.12 3,672,546
567 3,672,547

**CLASS 224**

5G 3,672,548
42.1E 3,672,549

**CLASS 225**

34 3,672,550
100 3,672,551

**CLASS 226**

108 3,672,655
129 3,672,552

**CLASS 227**

62 3,672,553
93 3,672,554
120 3,672,555

**CLASS 228**

47 3,672,556

**CLASS 229**

1.5B Re.27,409
17R 3,672,557
37R 3,672,558
39R 3,672,559
44R 3,672,693
44 3,672,560
51D 3,672,561
54C 3,672,562

**CLASS 232**

1R 3,672,563

**CLASS 233**

26 3,672,564

**CLASS 234**

36 3,672,565

**CLASS 235**

60.49 3,672,566
61.11R 3,673,389
92SH 3,673,390
92R 3,673,388
150.3 3,673,391
150.5 3,673,392
151.1 3,673,393
151.11 3,672,834

3,673,395
3,673,396
151.3 3,673,394
153 3,673,397
154 3,673,398
156 3,673,399
196 3,673,400

**CLASS 236**

1C 3,672,567
44 3,672,568

**CLASS 239**

15 3,672,569
70 3,672,570
145 3,672,571
212 3,672,572
261 3,672,573
428.5 3,672,574
445 3,672,575
521 3,672,576
557 3,672,577
590 3,672,578

**CLASS 240**

11.4 3,673,401
51.11R 3,673,402
64 3,673,403

**CLASS 241**

24 3,672,579
51 Re.27,414
79 3,672,580
101R 3,672,581

**CLASS 242**

18R 3,672,582
3,672,583
3,672,584
27 3,672,585
3,672,586
43 3,672,587
45 3,672,588
3,672,589
47.12 3,672,590
55.2 3,672,591
55.21 3,672,592
67.4 3,672,593
71.8 3,672,594
75.2 3,672,595
75.43 3,672,596
107R 3,672,597
118.2 3,672,598
184 3,672,599
186 3,672,600
192 3,672,601
3,672,602
194 3,672,603
199 3,672,604

**CLASS 244**

1SS 3,672,605
3,672,606
3.16 3,672,607
43 3,672,608
122AE 3,672,609
134R 3,672,610

**CLASS 246**

28R 3,672,611

**CLASS 248**

62 3,672,613
68 3,672,614
74PB 3,672,615
75 3,672,616
3,672,617
113 3,672,619
116 3,672,618
125 3,672,620
223 3,672,621
224 3,672,622
226R 3,672,623
243 3,672,624
361R 3,672,612
429 3,672,625

**CLASS 249**

48 3,672,626

**CLASS 250**

41.9ME 3,673,404
41.9S 3,673,405
43 3,673,406
52 3,673,407
61.5 3,673,408
106R 3,673,409
106T 3,673,410
108R 3,673,411
201 3,673,412
206 3,673,413
3,673,414
214P 3,673,415
219DC 3,673,416
219DR 3,673,418
219TH 3,673,420
219D 3,673,417
222R 3,673,419
229 3,673,421

**CLASS 251**

30 3,672,627
47 3,672,628
61.2 3,672,629
149.2 3,672,630
149.6 3,672,631
151 3,672,632
304 3,672,633

**CLASS 252**

1 3,673,087
2 3,673,088
8.55D 3,673,124
42.1 3,673,089
45 3,673,090
51.5R 3,673,091
63.7 3,673,093
79.4 3,673,094
88 3,673,095
89 3,673,096
153 3,673,097
156 3,673,098
3,673,099
301.1L 3,673,103
301.1R 3,673,101
301.3R 3,673,100
301.4S 3,673,102
313S 3,673,104
321 3,673,105
356 3,673,106
408 3,673,107
411R 3,673,108
415 3,673,109
427 3,673,110
435 3,673,111
441 3,673,112
3,673,113
454 3,673,114
459 3,673,115
466J 3,673,116
511 3,673,121
512 3,673,117
520 3,673,092
3,673,118
3,673,119
522 3,673,120
555 3,673,122

**CLASS 254**

2C 3,672,634
28 3,672,635
134.3R 3,672,636
167 3,672,637

**CLASS 256**

12.5 3,672,638

**CLASS 259**

1R 3,672,639
6 3,672,640
9 3,672,641
50 3,672,642
72 3,672,643
104 3,672,644
122 3,672,645
151 3,672,646

**CLASS 260**

2.5HA 3,673,127
2.5E 3,673,126
2.5F 3,673,125
3,673,130
2.5L 3,673,133
2.5N 3,673,132
2.5R 3,673,129
3,673,131
2.5 3,673,128
5 3,673,134
17A 3,673,135
17.4BB 3,673,136
19 3,673,137
22TN 3,673,138
3,673,140
22R 3,673,139
28.5AS 3,673,141
29.2EP 3,673,558
29.6RW 3,673,142
30.2 3,673,143
30.4R 3,673,144
32.4N 3,673,145
37PC 3,673,146
37N 3,673,147
38 3,673,276
39R 3,673,148
41.5A 3,673,150
45.8N 3,673,149
3,673,152
45.85 3,673,151
47C 3,673,153
65 3,673,155
67FP 3,673,156
75N 3,673,158
75R 3,673,157
77.5AB 3,673,159
78TF 3,673,160
78L 3,673,161
78R 3,673,162
80.3N 3,673,164
82.5 3,673,165
83.7 3,673,166
92.8R 3,673,167
94.2R 3,673,168
158 3,673,169
202 3,673,170
233.3R 3,673,171
239HM 3,673,174
239.3B 3,673,172
239.5 3,673,173
3,673,175
239.55R 3,673,180
239.55 3,673,179
240TC 3,673,176
240G 3,673,181
240.3 3,673,177
240.8 3,673,178
242 3,673,182
243C 3,673,183
247.2R 3,673,184
253 3,673,187
256.5B 3,673,185
268R 3,673,186
279R 3,673,163
281 3,673,192
288R 3,673,188
289R 3,673,189
290HL 3,673,190
293.54 3,673,195
293.55 3,673,194
293.57 3,673,191
294.9 3,673,196
295AM 3,673,197
295R 3,673,198
295.5B 3,673,193
296D 3,673,199
301 3,673,200
302R 3,673,201
304 3,673,202
306.6A 3,673,204
306.7 3,673,205
3,673,206
306.8D 3,673,203
307F 3,673,207
309 3,673,208
309.2 3,673,209
3,673,210
326.14R 3,673,213
326.3 3,673,212
3,673,214
326.5FL 3,673,211
332.2R 3,673,215
333 3,673,216
340.9 3,673,217
345.2 3,673,218
346.2M 3,673,219
360 3,673,220
372 Re.27,413
374 3,673,221
396R 3,673,222
397.4 3,673,223
3,673,224
397.5 3,673,225
410.6 3,673,226
412.6 3,673,227
428 3,673,228
429R 3,673,229
429.7 3,673,230
429.9 3,673,231
439CY 3,673,232
448.2N 3,673,233
453R 3,673,234
465.4 3,673,235
3,673,236
468P 3,673,237
471A 3,673,238
473A 3,673,239
485G 3,673,240
501.12 3,673,241
507R 3,673,242
518R 3,673,243
524R 3,673,154
3,673,244
531R 3,673,245
543PN 3,673,248
543H 3,673,246
543R 3,673,247
553R 3,673,249
561N 3,673,250
563D 3,673,251
564F 3,673,253
564R 3,673,252
566D 3,673,254
571 3,673,123
586R 3,673,255
598 3,673,256
600 3,673,257
602 3,673,258
607A 3,673,259
609A 3,673,260
617F 3,673,261
619A 3,673,262
631.5 3,673,263
3,673,266
633 3,673,264
666PY 3,673,268
666P 3,673,267
677XA 3,673,269
680R 3,673,270
681 3,673,265
683.62 3,673,271
827 3,673,272
830P 3,673,273
836 3,673,274
837R 3,673,275
857UN 3,673,277
873 3,673,278
876R 3,673,279
878R 3,673,280
880B 3,673,281
884 3,673,282
898 3,673,283
944 3,673,284
970 3,673,285

**CLASS 261**

121R 3,672,647

**CLASS 263**

21A 3,672,648
40R 3,672,654
46 3,672,649

**CLASS 264**

3R 3,673,286
3 3,673,287
24 3,673,296
25 3,673,288
28 3,673,289
43 3,673,290
46 3,673,291
49 3,673,292
60 3,673,293
75 3,673,294
89 3,673,295
138 3,673,297
142 3,673,298
159 3,673,299
160 3,673,300
163 3,673,301
328 3,673,302

**CLASS 266**

23F 3,672,651
33R 3,672,650
34LM 3,672,652
34T 3,672,653

**CLASS 267**

47 3,672,656
116 3,672,657
160 3,672,658
182 3,672,659

**CLASS 269**

203 3,672,660

**CLASS 270**

31 3,672,661
3,672,662

**CLASS 271**

3 3,672,664
26 3,672,666
39 3,672,665
61 3,672,668
64 3,672,663
74 3,672,667

**CLASS 272**

33B 3,672,669
79R 3,672,670

**CLASS 273**

22 3,672,671
26A 3,672,672
54B 3,672,673
94R 3,672,674
96R 3,672,675
101 3,672,676
106.5R 3,672,677
3,672,678
131AB 3,672,680
131BA 3,672,679
157R 3,672,681
189R 3,672,682

**CLASS 274**

4A 3,672,686
4D 3,672,684
4F 3,672,683
4G 3,672,685
9RA 3,672,687
14 3,672,688

**CLASS 277**

38 3,672,689
134 3,672,690

**CLASS 279**

1TS 3,672,691
82 3,672,692

**CLASS 280**

11.35K 3,672,694
3,672,695
15 3,672,696
87A 3,672,697
124A 3,672,698
150AB 3,672,699
150R 3,672,700
414.5 3,672,701
457 3,672,702

**CLASS 282**

25 3,672,703

**CLASS 285**

39 3,672,705
110 3,672,704
189 3,672,706
229 3,672,707
315 3,672,708
419 3,672,709

**CLASS 287**

20.2R 3,672,712
56 3,672,710
189.36R 3,672,711

**CLASS 292**

34 3,672,714
216 3,672,713
257 3,672,715
346 3,673,605

**CLASS 294**

50.6 3,672,716
104 3,672,717

**CLASS 296**

1S 3,672,718

**CLASS 297**

118 3,672,719
3,672,720
302 3,672,721
437 3,672,722
440 3,672,723

**CLASS 298**

27 3,672,724

**CLASS 299**

8 3,672,725
31 3,672,726

**CLASS 302**

2R 3,672,727

**CLASS 303**

6C 3,672,728
9 3,672,729
21BE 3,672,730
21F 3,672,731
84A 3,672,732

**CLASS 307**

87 3,673,422
107 3,673,423
118 3,673,424
127 3,673,425
3,673,426
202 3,673,427
3,673,428
218 3,673,429
232 3,673,430
241 3,673,431
246 3,673,432
3,673,436
247A 3,673,433
247 3,673,434
252J 3,673,437
257 3,673,435
270 3,673,438
293 3,673,439

**CLASS 308**

9 3,672,733
26 3,672,734
180 3,672,735
187.2 3,672,736
196 3,672,737

**CLASS 310**

4 3,673,440
8.4 3,673,442
8.6 3,673,441
8.7 3,673,443
10 3,673,444
88 3,673,445
172 3,673,446
227 3,673,447

**CLASS 312**

71 3,672,738
107 3,672,739
202 3,672,740
223 3,672,741
232 3,672,742
352 3,672,743

**CLASS 313**

86 3,673,448
105 3,673,449
108A 3,673,450
109.5 3,673,451
141 3,673,452
318 3,673,453
332 3,673,454

**CLASS 315**

12 3,673,457
27R 3,673,458
36 3,673,459
83 3,673,456
169TV 3,673,461
169R 3,673,460
200A 3,673,462

**CLASS 317**

3 3,673,463
29R 3,673,455
43 3,673,464
123 3,673,465
134 3,673,466
3,673,467
234R 3,673,469
3,673,470
3,673,478
234 3,673,468
235R 3,673,471
262A 3,673,472

**CLASS 318**

7 3,673,473
116 3,673,474
122 3,673,475
138 3,673,476
208 3,673,479
221G 3,673,480
224R 3,673,477
246 3,673,481
266 3,673,482
618 3,673,483
674 3,673,484

**CLASS 320**

2 3,673,485
25 3,673,486

**CLASS 321**

18 3,673,487

**CLASS 322**

28 3,673,488
3,673,489
50 3,673,490

**CLASS 323**

48 3,673,491
74 3,673,492

**CLASS 324**

37 3,673,493
41 3,673,494
142 3,673,495
161 3,673,496

**CLASS 325**

180 3,673,497
319 3,673,498
398 3,673,499
473 3,673,500

**CLASS 328**

37 3,673,501
146 3,673,502
167 3,673,503
210 3,673,504

**CLASS 329**

50 3,673,505
103 3,673,506

**CLASS 330**

30D 3,673,508
30R 3,673,507
31 3,673,509
34 3,673,510
44 3,673,511
97 3,673,512

**CLASS 331**

94.5 3,673,513
107R 3,673,514

**CLASS 332**

31T 3,673,515

**CLASS 333**

1.1 3,673,518
5 3,673,516
6 3,673,519
8 3,673,517
28R 3,673,520
3,673,521
73W 3,673,522

**CLASS 334**

15 3,673,523

**CLASS 335**

52 3,673,524
132 3,673,525
205 3,673,526
207 3,673,527
210 3,673,528
234 3,673,529

**CLASS 336**

70 3,673,530

**CLASS 337**

77 3,673,531
102 3,673,532
161 3,673,533
258 3,673,534
347 3,673,535
392 3,673,536

**CLASS 338**

12 3,673,537
25 3,673,538
154 3,673,539
196 3,673,540

**CLASS 339**

14R 3,673,542
16R 3,673,541
61L 3,673,544
61M 3,673,543
64M 3,673,545
89C 3,673,546
3,673,547

| | |
|---|---|
| 186M | 3,673,548 |
| 220R | 3,673,549 |
| 225 | 3,673,550 |
| 258R | 3,673,551 |
| **CLASS 340** | |
| 3R | 3,673,552 |
| | 3,673,553 |
| | 3,673,554 |
| 5R | 3,673,555 |
| 7PC | 3,673,556 |
| 15.5H | 3,673,557 |
| 18 | 3,673,559 |
| 33 | 3,673,560 |
| 52R | 3,673,561 |
| 63 | 3,673,562 |
| 71 | 3,673,563 |
| 81R | 3,673,564 |
| 82 | 3,673,565 |
| 146.3AE | 3,673,566 |
| 147R | 3,673,568 |
| | 3,673,569 |
| 147 | 3,673,570 |
| 148 | 3,673,567 |
| 149A | 3,673,571 |
| 166EL | 3,673,572 |

| | |
|---|---|
| 172.5 | 3,673,573 |
| | 3,673,574 |
| | 3,673,575 |
| | 3,673,576 |
| | 3,673,577 |
| 173CC | 3,673,578 |
| 173LS | 3,673,579 |
| 174MS | 3,673,582 |
| 174PC | 3,673,580 |
| 174PW | 3,673,581 |
| 174.1C | 3,673,583 |
| | 3,673,584 |
| 198 | 3,673,585 |
| 237S | 3,673,586 |
| 244A | 3,673,587 |
| 248A | 3,673,588 |
| 258A | 3,673,590 |
| 258D | 3,673,589 |
| 259 | 3,673,591 |
| 283 | 3,673,592 |
| **CLASS 343** | |
| 766 | 3,673,606 |
| **CLASS 346** | |
| 17 | 3,673,607 |
| 18 | 3,673,608 |

| | |
|---|---|
| 74CR | 3,673,599 |
| 74ES | 3,673,593 |
| | 3,673,595 |
| | 3,673,596 |
| | 3,673,598 |
| | 3,673,600 |
| 74MT | 3,673,594 |
| 74TP | 3,673,597 |
| 75 | 3,673,601 |
| 107A | 3,673,602 |
| 139B | 3,673,604 |
| 139R | 3,673,603 |
| **CLASS 350** | |
| 3.5 | 3,672,744 |
| 92 | 3,672,745 |
| 163 | 3,672,746 |
| 216 | 3,672,747 |
| 220 | 3,672,748 |
| 319 | 3,672,749 |
| **CLASS 351** | |
| 43 | 3,672,750 |
| **CLASS 352** | |
| 30 | 3,672,751 |
| 72 | 3,672,752 |

| | |
|---|---|
| 91 | 3,672,753 |
| 158 | 3,672,754 |
| 194 | 3,672,755 |
| **CLASS 353** | |
| 68 | 3,672,756 |
| 101 | 3,672,757 |
| **CLASS 355** | |
| 3 | 3,672,758 |
| | 3,672,759 |
| | 3,672,760 |
| | 3,672,761 |
| 10 | 3,672,762 |
| | 3,672,763 |
| 15 | 3,672,764 |
| 24 | 3,672,765 |
| 32 | 3,672,766 |
| 37 | 3,672,767 |
| 38 | 3,672,768 |
| 40 | 3,672,769 |
| 97 | 3,672,770 |
| 100 | 3,672,771 |
| **CLASS 356** | |
| 33 | 3,672,772 |
| 86 | 3,672,774 |

| | |
|---|---|
| 103 | 3,672,775 |
| 106 | 3,672,776 |
| 135 | 3,672,777 |
| 138 | 3,672,778 |
| | 3,672,779 |
| 195 | 3,672,780 |
| 201 | 3,672,781 |
| 251 | 3,672,782 |
| **CLASS 401** | |
| 116 | 3,672,783 |
| **CLASS 408** | |
| 178 | 3,672,784 |
| 206 | 3,672,785 |
| **CLASS 415** | |
| 147 | 3,672,786 |
| **CLASS 416** | |
| 43 | 3,672,788 |
| 97 | 3,672,787 |
| **CLASS 417** | |
| 51 | 3,672,789 |

| | |
|---|---|
| 108 | 3,672,790 |
| 205 | 3,672,791 |
| 306 | 3,672,792 |
| 368 | 3,672,793 |
| 382 | 3,672,794 |
| 424 | 3,672,795 |
| **CLASS 418** | |
| 26 | 3,672,796 |
| 113 | 3,672,798 |
| 125 | 3,672,797 |
| **CLASS 425** | |
| 71 | 3,672,800 |
| | 3,672,801 |
| 131 | 3,672,802 |
| 197 | 3,672,803 |
| 328 | 3,672,804 |
| 330 | 3,672,799 |
| 364 | 3,672,348 |
| 391 | 3,672,805 |
| 406 | 3,672,806 |
| 422 | 3,672,807 |
| **CLASS 431** | |
| 2 | 3,672,808 |
| 34 | 3,672,809 |
| 66 | 3,672,810 |
| 69 | 3,672,811 |
| 89 | 3,672,812 |
| 95 | 3,672,813 |
| | 3,672,814 |

## CLASSIFICATION OF DESIGNS

| | | |
|---|---|---|
| D 2— | 234 | 223,983 |
| | 357 | 223,984 |
| | 427 | 223,985 |
| D 8— | 27 | 223,988 |
| | 30 | 223,986 |
| | 61 | 223,987 |
| | 170 | 223,989 |
| | | 223,990 |
| | | 223,991 |
| | | 223,992 |
| | 177 | 223,993 |
| | 203 | 223,994 |
| D 9— | 41 | 223,995 |
| | 141 | 223,996 |
| | 157 | 223,997 |
| | 219 | 223,998 |

| | | |
|---|---|---|
| | 220 | 223,999 |
| D13— | 1 | 224,000 |
| | | 224,001 |
| D14— | 3 | 224,002 |
| | 6 | 224,003 |
| | | 224,004 |
| | 24 | 224,005 |
| | 30 | 224,006 |
| D15— | 1 | 224,007 |
| D18— | 2 | 224,008 |
| D22— | 13 | 224,010 |
| | 27 | 224,009 |
| D23— | 129 | 224,041 |
| | 139 | 224,011 |
| | | 224,012 |
| | | 224,013 |

| | | |
|---|---|---|
| D26— | 5 | 224,014 |
| | | 224,017 |
| | | 224,018 |
| | | 224,019 |
| | | 224,020 |
| | | 224,021 |
| | 13 | 224,015 |
| | | 224,016 |
| | 14 | 224,022 |
| | | 224,023 |
| | | 224,024 |
| | | 224,025 |
| D28— | 1 | 224,026 |
| D33— | 3 | 224,027 |
| | 24 | 224,028 |
| D34— | 5 | 224,029 |

| | | |
|---|---|---|
| | 15 | 224,030 |
| D35— | 3 | 224,031 |
| D36— | 8 | 224,035 |
| D40— | 1 | 224,032 |
| D42— | | 224,033 |
| D44— | 4 | 224,037 |
| | 21 | 224,034 |
| D45— | 19 | 224,036 |
| D48— | 20 | 224,038 |
| | 31 | 224,039 |
| | 32 | 224,040 |
| D49— | 8.1 | 224,042 |
| D52— | 2 | 224,043 |
| | 6 | 224,044 |
| | | 224,045 |
| | | 224,046 |

| | | |
|---|---|---|
| | 7 | 224,047 |
| | | 224,048 |
| D54— | 13 | 224,049 |
| D56— | 1 | 224,050 |
| | 2 | 224,051 |
| | 9 | 224,052 |
| D61— | 1 | 224,053 |
| | | 224,054 |
| | | 224,055 |
| | | 224,056 |
| | | 224,057 |
| D64— | 11 | 224,058 |
| D80— | 9 | 224,059 |
| | | 224,060 |
| | | 224,061 |

| | | |
|---|---|---|
| | | 224,062 |
| D81— | 10 | 224,063 |
| | | 224,064 |
| D83— | 1 | 224,069 |
| | | 224,070 |
| | 12 | 224,065 |
| | | 224,066 |
| | | 224,067 |
| | | 224,068 |
| D86— | 10 | 224,071 |
| D87— | 3 | 224,072 |
| D88— | | 224,073 |
| D90— | | 224,074 |
| | 20 | 224,075 |
| D96— | 12 | 224,076 |

## CLASSIFICATION OF PLANTS

| | | |
|---|---|---|
| P. — | 45 | 3,222 |
| P. — | 74 | 3,220 |
| P. — | 80 | 3,221 |
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| 3,672,218 | 3,672,395 | 3,673,079 | 3,672,370 | 3,672,964 | 3,672,318 |
| 3,673,036 | 3,672,408 | 3,673,080 | 3,672,445 | 3,673,056 | 3,672,326 |
| 3,673,075 | 3,672,446 | 3,673,084 | 3,672,527 | 3,673,179 | 3,672,358 |
| 3,673,287 | 3,672,447 | 3,673,108 | 3,673,061 | 3,673,270 | 3,672,367 |
| 4 : 3,672,364 | 3,672,459 | 3,673,112 | 3,673,232 | 3,673,275 | 3,672,378 |
| 3,672,855 | 3,672,517 | 3,673,122 | 3,673,323 | 11 : 3,673,440 | 3,672,418 |
| 5 : 3,672,098 | 3,672,524 | 3,673,124 | 3,673,473 | 12 : 3,672,369 | 3,672,426 |
| 3,672,198 | 3,672,528 | 3,673,181 | 3,673,586 | 3,672,576 | 3,672,436 |
| 6 : Re.27,408 | 3,672,535 | 3,673,190 | 9 : Re.27,410 | 3,672,608 | 3,672,441 |
| Re.27,411 | 3,672,543 | 3,673,207 | 3,672,006 | 3,672,612 | 3,672,479 |
| 3,671,976 | 3,672,556 | 3,673,213 | 3,672,049 | 3,672,703 | 3,672,494 |
| 3,671,980 | 3,672,592 | 3,673,227 | 3,672,162 | 3,672,724 | 3,672,525 |
| 3,672,017 | 3,672,594 | 3,673,231 | 3,672,163 | 3,672,828 | 3,672,529 |
| 3,672,022 | 3,672,599 | 3,673,252 | 3,672,194 | 3,672,908 | 3,672,534 |
| 3,672,024 | 3,672,603 | 3,673,306 | 3,672,211 | 3,672,909 | 3,672,550 |
| 3,672,035 | 3,672,605 | 3,673,327 | 3,672,255 | 3,673,021 | 3,672,551 |
| 3,672,043 | 3,672,611 | 3,673,348 | 3,672,354 | 3,673,168 | 3,672,564 |
| 3,672,045 | 3,672,632 | 3,673,349 | 3,672,463 | 3,673,240 | 3,672,567 |
| 3,672,050 | 3,672,640 | 3,673,360 | 3,672,493 | 3,673,358 | 3,672,569 |
| 3,672,066 | 3,672,643 | 3,673,370 | 3,672,532 | 3,673,419 | 3,672,573 |
| 3,672,074 | 3,672,651 | 3,673,384 | 3,672,544 | 3,673,424 | 3,672,596 |
| 3,672,076 | 3,672,657 | 3,673,392 | 3,672,545 | 3,673,452 | 3,672,623 |
| 3,672,083 | 3,672,659 | 3,673,394 | 3,672,597 | 13 : 3,672,061 | 3,672,627 |
| 3,672,084 | 3,672,676 | 3,673,397 | 3,672,604 | 3,672,199 | 3,672,648 |
| 3,672,095 | 3,672,679 | 3,673,412 | 3,672,616 | 3,672,335 | 3,672,649 |
| 3,672,099 | 3,672,694 | 3,673,427 | 3,672,629 | 3,672,430 | 3,672,701 |
| 3,672,104 | 3,672,695 | 3,673,450 | 3,672,661 | 3,672,539 | 3,672,720 |
| 3,672,114 | 3,672,702 | 3,673,471 | 3,672,721 | 3,672,554 | 3,672,747 |
| 3,672,152 | 3,672,705 | 3,673,474 | 3,672,787 | 3,673,033 | 3,672,757 |
| 3,672,170 | 3,672,712 | 3,673,475 | 3,672,827 | 3,673,039 | 3,672,772 |
| 3,672,171 | 3,672,717 | 3,673,480 | 3,672,912 | 3,673,344 | 3,672,807 |
| 3,672,178 | 3,672,725 | 3,673,491 | 3,672,931 | 16 : 3,673,456 | 3,672,820 |
| 3,672,180 | 3,672,760 | 3,673,504 | 3,673,001 | 17 : Re.27,409 | 3,672,835 |
| 3,672,191 | 3,672,771 | 3,673,511 | 3,673,054 | Re.27,412 | 3,672,836 |
| 3,672,193 | 3,672,773 | 3,673,513 | 3,673,128 | 3,672,015 | 3,672,837 |
| 3,672,201 | 3,672,776 | 3,673,529 | 3,673,250 | 3,672,067 | 3,672,838 |
| 3,672,207 | 3,672,782 | 3,673,544 | 3,673,325 | 3,672,087 | 3,672,840 |
| 3,672,224 | 3,672,785 | 3,673,548 | 3,673,334 | 3,672,108 | 3,672,845 |
| 3,672,226 | 3,672,790 | 3,673,560 | 3,673,382 | 3,672,111 | 3,672,854 |
| 3,672,256 | 3,672,917 | 3,673,569 | 3,673,404 | 3,672,125 | 3,672,856 |
| 3,672,261 | 3,672,949 | 3,673,574 | 3,673,407 | 3,672,132 | 3,672,858 |
| 3,672,289 | 3,672,950 | 3,673,575 | 3,673,416 | 3,672,135 | 3,672,885 |
| 3,672,292 | 3,672,952 | 3,673,579 | 3,673,432 | 3,672,136 | 3,672,889 |
| 3,672,299 | 3,672,955 | 3,673,590 | 10 : 3,672,799 | 3,672,137 | 3,672,893 |
| 3,672,303 | 3,672,960 | 3,673,602 | 3,672,800 | 3,672,138 | 3,672,914 |
| 3,672,304 | 3,672,968 | 3,673,604 | 3,672,865 | 3,672,164 | 3,672,916 |
| 3,672,340 | 3,672,972 | 3,673,605 | 3,672,867 | 3,672,172 | 3,673,009 |
| 3,672,341 | 3,672,995 | 8 : 3,672,072 | 3,672,876 | 3,672,181 | 3,673,065 |
| 3,672,362 | 3,673,026 | 3,672,103 | 3,672,933 | 3,672,233 | 3,673,091 |
| 3,672,365 | 3,673,058 | 3,672,208 | 3,672,934 | 3,672,237 | 3,673,104 |

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